Development and Valuation of Urban Properties

Buy and Build to Get Your Money's Worth

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P. K. Ratho

VIGYAN PRASAR

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ACKNOWLEDGEMENTS

A book that attempts to be a users' guide for practicing engineers, architects and valuers could not have been produced with my efforts alone. I have discussed the subject with so many experts in several seminars and workshops that it will be too voluminous to list their individual contributions. I express my deep gratitude to them. In particular I would like to thank Shri B. Kanagasabapathy, practicing valuer, for giving me the opportunity to present papers on the subject in the seminars organised by him and urging me to write the book for the benefit of practicing valuers. I express my special thanks to my son Devendranath Rath, without whose help my ideas would have remained where they originated -- the brain. It is he who put them on the computer and presented them in the form of a book that others could follow. It is great to feel that my wife Purnima not only put up with all the deprivations due to my long hours of work at home at all odd hours but in fact typed a part of the book on the computer to produce the first draft. I express my heartfelt thanks to her. Finally, I thank the scientists and the staff at Vigyan Prasar who appreciated my concern for the common man in his endeavour to provide one of the three basic necessities, *Roti, Kapda* aur *Makan* (food, clothing and shelter). In particular, I express my deep gratitude to Dr. Narender K. Sehgal and Dr. Subodh Mahanti.

FOREWORD

Food, clothing and shelter are the basic necessities. A building is necessary for every economic activity. This is reflected in the continuous growth of cities. The National Housing Policy envisages a larger role for the private sector. The role of the Government and the public sector banks is that of facilitators. Buying, selling or developing an urban property is a major investment decision for an individual and requires cost-benefit study. Similar is the need of housing finance agencies for feasibility studies. This is a skill greatly in demand, but short in supply. Apart from the knowledge about local bye-laws, materials and modern technology, estimating and valuation skills are essential to decide the best development of a property.

It is not easy to come by all the information necessary to develop a property. One comes up against the requirements of various authorities who have to approve the scheme for development. Often, the owner is not very clear about his own needs. An architect, well conversant with local bye-laws, materials and climate-based design of buildings can assist him in defining the requirements and evolving an appropriate design. However, to evaluate the cost-benefit ratio for the proposed building, value engineering and valuation concepts are essential.

Valuation of real estate is a fascinating subject. It is so because of differing interests, opinions and view-points of a seller of any property and its prospective buyer. Real estate market is a complex phenomenon. Evidently, there is no 'Indian Standard' for procedures to determine 'market-value' or a method of analysis of recorded sales. Had there been such a 'Standard', voluminous sales data and use of computers would have rendered valuation as a mathematical solution. It is this lack of a precise mathematical solution which has preserved this fascinating subject within the realm of the valuer's skills. People need to buy and sell properties; hence the need for the valuer's skills.

Even a valuer must know the purpose of valuation. For sale or purchase, it is the market value. For mortgage purposes it could be the valuation by rent capitalisation method for an occupied property. 'Cost' of the property is not the same as its value. But cost of reproduction, duly depreciated for age and obsolescence, can be the touchstone to judge the final value, giving proper weightage to market-forces.

There could also be functional obsolescence in a given property like flooring and wall finishes not suitable for the planned use, lack of fire escape or toilets required as per present bye-laws. Possibility and cost of making up such deficiencies could be estimated precisely and stated in the report. This could be deductible from depreciated cost only if reproduction cost adopted is from a modern structure with all these items.

There can be no two opinions about which is the best and most reliable method of determining value of any property. Undoubtedly, it is the method based on previous sales. Shri P.K. Ratho, in his official capacity, had access to a very large number of agreements for sales, all with required details as on the dates of sales. He has done a commendable job in tabulating, analysing, applying statistical principles and using computer power to give graphical solutions. This initiative is highly laudable. Such systematic analyses of voluminous data by the method suggested can be very gainfully used by valuers to determine fair market values of properties and by Municipal Corporations, Development Control authorities and Government for equitable tax structure, levy of betterment charges and laying down guideline values for registration and stamp duty.

As already stated by the author, such statistical and graphical results will give different results in different cities in different time spans and even within the same city these will be different in different localities, neighbourhoods and class of properties.

Individual valuer handling valuation of a given property for a specific client has no access to such data. The valuer has to depend on relatively smaller number of nearby instances, without full data about such properties. He has to necessarily analyse all such available sales, property by property, comparing it with property under valuation, using same principles as enunciated in this book to arrive at a set of different end values of a property under valuation. His final opinion on value of the property should take into account all these different values and give cogent reasons why and how his final recommendation is arrived at. Under these circumstances it is important to give the valuation based on Land plus Building Reproduction cost method and to clarify why and how his own recommendation of value differs from it. My own baptism to valuation was in the acquisition cell of the Estate Agent and Land Management Department of Mumbai Municipal Corporation in early 1950s. It involved valuation of large properties by various methods, using similar principles, and defending the valuation before land acquisition courts.

Finally, I will still opine that valuation is a fascinating subject, an art based on skilful application of the broad principles of valuation and knowledge of real estate market and experience in cost estimations, and that it is not an exact science based on precise procedures to give precise answers. That is what makes valuation an interesting subject.

It may not be difficult to find a book on architecture, the National Building Code, Bye-laws or even a book on valuation. However, it is difficult to find a book that integrates all the information necessary to develop on urban property and value it. It is heartening to see that the author has adequately and competently covered all these aspects in the book.

Bangalore
11th May, 1998

M.K. Koundinya
Addl. Director General
Works
CPWD (Retd.)

PREFACE

Those familiar with the avowed objectives of Vigyan Prasar may get a bit perplexed by the title of this book. They would be right in wondering what relation is there between "Development and Valuation of Urban Properties" and "science popularisation"!

Admittedly, the Publications Programme of Vigyan Prasar is still evolving and it would be a while before firmer contours emerge. Some series have already evolved and some others are in the process of evolving. While we strongly believe in experimentation, no title is included in our publications programme without a great deal of thought.

Science popularisation does involve talking about science and its applications; explaining scientific aspects of natural phenomena; effectively debunking superstitious beliefs; informing people about what is going on at the frontiers of science and technology; making people conscious of the need of conserving the physical environment around them; imparting technological skills to people; and so on — and most importantly, in the process, helping and enabling people to internalise the method of science.

While each of the above aspects of science popularisation is important, the end result of all science popularisation programmes has to be an improvement in the quality of life of the people — collectively as individuals, as communities and as a nation. In fact that is the bottom-line. Else there would be no justification for spending public funds on a science popularisation programme.

This book was selected with a purpose. Buying, selling or developing a property is a major investment decision and an individual spends a large part if not all of ones life's savings on building a house — one of the three basic necessities for any individual i.e., food, clothing and housing, or *roti, kapda* aur *makaan*! For making a correct decision one should not only know about local bye-laws, materials and modern technology but one should also be familiar with estimation and evaluation procedures. This book explains all about developing and valuing an urban property. Of course, for a lay-person without appropriate background it may not be possible to get a full grasp of this subject. But one will surely get a good idea about what to look for and where and whom to contact, before making an investment decision. The book seeks to establish that, following a scientific methodology, it is possible to make use of the huge mass of available data, analytical methods and statistical principles, to arrive at objective evaluations of properties.

Written by one who has more than 20 years of experience in the field, the book will become a users' manual for architects, engineers and valuers. They would be able to apply the principles enunciated step by step to arrive at correct decisions and help some individuals from being taken for a ride. That is the reason why we chose the title that we have— to send the correct signal to the professionals. For Vigyan Prasar this book is only a beginning for a mission. Our ultimate objective is to create a variety of software on housing and related subjects and make common people aware of it and use it for arriving at correct decisions. We are also developing a number of multi-media games on the space and living structures for children. Plans are also afoot to develop related computer software for the purpose.

This book will hopefully bring Vigyan Prasar closer to engineers, valuers, real estate developers and many others engaged in the housing and construction sectors. We do hope that this book would attract many engineers to Vigyan Prasar for sharing newer ideas for better and low-cost buildings and dwellings.

Narender K. Sehgal
Director
Vigyan Prasar

VIGYAN PRASAR
An Introduction

Vigyan Prasar (VP) was set up by the Department of Science and Technology, Government of India, as an autonomous registered Society in 1989 for taking up large-scale science popularisation tasks. Its broad objectives may be summarised as follows:

To undertake, aid, promote, guide and co-ordinate efforts in popularisation of science and inculcation of scientific temper among the people and to increase the knowledge, awareness and interest about science and technology among all segments of the society.

To provide and promote effective linkages on a continuing basis among various scientific institutions, agencies, educational and academic bodies, laboratories, museums, industry, trade and other organisations for effective exchange and dissemination of S&T information.

To undertake development of materials — audio, visual, audio-visual and printed — methods and modes of communication, so as to enable the masses to better understand, appreciate and comprehend abstract scientific principles and practices.

To organise research work, courses, workshops, seminars, symposia, training programmes, fairs, exhibitions, film-shows, popular discussions, street plays, quizzes, song-dance-dramas etc., in furtherance of the objectives of the Society.

After its establishment Vigyan Prasar remained dormant for a few years. Only in 1994 some activities could be taken up in right earnest. One among the first few programmes initiated by Vigyan Prasar was the 'Ready-to-Print' Science Page project. The idea was to prepare a well laid-out newspaper-size page with one or two features and several smaller items on scientific and technological (S&T) developments taking place in India, appropriately supported with photographs, illustrations, graphics etc., and to supply it to newspapers to carry as it is. Initially, such pages in Hindi and English were planned for release once a month. Subsequently, a children's page, science pages in other major Indian languages and a feature packet service were also added. Today, these pages are being carried once or twice a month by more than 30 editions of some 20 newspapers spread all over the country. In fact, today Vigyan Prasar's are the largest circulated science pages in the country. The combined print order of all these newspapers exceeds 2.5 million copies. These pages have led to fresh demands for enhanced science coverage in other newspapers.

Vigyan Prasar's publications programme is gradually taking shape. A number of important series has been launched; some more are planned. The first major English publication brought out by Vigyan Prasar, viz., *"Memoirs of Ruchi Ram Sahni: Pioneer of Science Popularisation in Punjab,"* under its series on Pioneer Science Popularisers in Pre-Independence India has generated positive awareness among science communicators and enthused researchers about the need to unearth other such personalities in other parts of the country. Already names of a number of individuals who did pioneering work in the field of science popularisation in pre-Independence India have come to light.

Popular science classics written by Great Masters in the past, which have inspired generations of students of science, are no longer seen in the hands of our younger generation. This is not because these books have gone out of context, but because they are no longer available. Vigyan Prasar under its Popular Science Classics series intends to reprint these books and bring them out in low-priced affordable editions so that more and more children can have them. Already two such classics (Michael Faraday's *Chemical History of a Candle* and C.V. Boys' *Soap Bubbles And the Forces Which Mould Them)* have been brought out and more are on the way.

Inspired by the focal theme for the National Science Day - 1995, viz., 'Science for Health', Vigyan Prasar initiated a Health Series. Under it publications on all common diseases, along with possible management of their curative and preventive aspects would be brought out. The first three titles on *Sexually Transmitted Diseases, Asthma and Jaundice*, have already been released.

Under its series of Monographs on India's Scientific Heritage Vigyan Prasar intends to bring out publications on specific science and technology areas in which India's contributions have stood the test of time, as also have made an impact on modern-day science. The first monograph in the series, *'The Rustless Wonder: A Study of the Iron Pillar at Delhi'* was released on 30 January 1997. The second volume '*Where Gods Come Alive : A Study of the South Indian Bronze Icons* ' would be going to the press shortly.

The Total Solar Eclipse of October 24, 1995, provided Vigyan Prasar a rare opportunity to organise a country-wide awareness campaign, aimed at dispelling age-old myths and superstitious beliefs related to eclipses, and to develop among people an urge to learn about their known scientific aspects. Vigyan Prasar jointly with the National Council for Science and Technology Communication (NCSTC) organised a number of activities:

i. Telescope-making workshops for students and teachers.

ii. Development and production of books, a total solar eclipse chart and an activity kit for children.

iii. Production of several video films and their telecast.

Vigyan Prasar conceptualised and implemented a novel idea for ensuring that people did come out and watch the total solar eclipse. It circulated a total solar eclipse pledge. People in thousands from all corners of the country sent in signed pledges. Many individuals and voluntary agencies got these pledges translated into regional languages on their own and distributed the same in large numbers. All this led to a chain of activities throughout the country. The efforts made by VP, NCSTC and other agencies created a situation where millions of people came out and watched the spectacular event. This was a unique experience and made Vigyan Prasar's name a household word throughout the country.

Under its audio-visual programme, Vigyan Prasar developed a set of video films and several radio programmes on the occasion of the total solar eclipse of 24 October, 1995. This event-based effort was enormously satisfying for the VP family and generated a very good response from the public at large.

Vigyan Prasar has recently begun building an Information System called VIPRIS — acronym for **VI**gyan **PR**asar **I**nformation **S**ystem — to meet a long-standing demand from different quarters, particularly the science communicators, to establish a repository of background data and information on various aspects of S&T which would be accessible easily. The computerised system would be built on a modular basis, and aim to meet the information needs of science communicators of all kinds.

At this stage, under VIPRIS, we have a fortnightly clippings service, an electronic bulletin board service (BBS), two pages daily on Doordarshan's teletext service and weekly science news on the radio. Several other products and services including training, development and production of CD-ROMs, generation of data bases on different subject areas etc., are being planned

The first phase of the database on " Environment & Safety Laws : Regulations & Guidance Documents " has been completed. VP launched its Homepage on the Internet on 12 September, 1996. An online electronic popular science magazine 'ComCom' , has been planned as part of the Homepage. The other sections of the Homepage are, About Vigyan Prasar , Daily Weather Report, Sky map of the days/month, links with other related homepage, S&T vacancies in India, News from S&T laboratories, S&T databases etc. It has provision for Hindi HTML and support for Web browsers / users to download the Hindi Plug-in and install it in their system. It has also a discussion forum with support to display and keep visitors' view.

Vigyan Prasar has also produced audio-cassette sets of the 108-part radio serial 'Manav Ka Vikas' (jointly produced by the NCSTC and All India Radio) in 18 Indian languages.

A number of video programse have also been produced. Recent ones among them have been on "Herbal petrol" and "Comets"(in connection with the coming of the comet "Hale-Bopp"). Several other programme are possibly under production.

This is not all. Vigyan Prasar does many other things. But for now this should suffice.

Narender K. Sehgal
Director
Vigyan Prasar

INTRODUCTION

In a society with a free market economy, an urban land is the most prized possession. The knowledge of its value is a prerequisite to the development of a land. Valuation of an urban property presupposes the knowledge of the nature of the real estate and its development. A real estate means an immovable property. The value of an immovable property is enormous.

Everybody is concerned about value. Nearly three-fourths of a nation's wealth is represented by land and its development. Most individuals spend the major part of their life's savings in acquiring it. Being the largest source of wealth, it is the backbone of an individual's and the nation's economy. No wonder, it is called, 'the real estate'. It is always being bought, sold, developed, leased, mortgaged, financed or managed to support other economic activities. Decision- making in each of these involves the valuation of a property. Real estate business is closely linked to the economy and its growth. He, who can analyse the sale instances and discern the trends in the real estate business, shall have the competitive edge.

The full value of a property is realised only when it is put to the highest and best possible use. To achieve this, the property needs to be developed. No development work can be started without preparing an appropriate scheme or model of the proposed development and obtaining the approval of the local bodies. The owner has to make several decisions, each involving cost and benefit. It is necessary to know the market values of the existing property and the proposed development. The architect and the engineer assist the owner to make the decisions which help to define the scheme or the model. Yet, it becomes difficult to evolve a model of the development, based on cost- benefit analysis. This was particularly highlighted during several workshops on value engineering with which the author was associated. From his experience of more than five years as the District Valuation Officer, the author was quick to notice the need for emphasis on value. The author felt that some aspects of the value approach to the valuation of buildings could be used in a value analysis to design a model of the proposed development. The concept is based on 'rating' of the specifications of the building components, based on their functional worths. Thus, a technique was carefully evolved to design the appropriate specifications for the proposed building, based on market values. The same concept was used for valuation of buildings by 'rating' the building components. As Member, Appropriate Authority Income Tax Department, for more than four years, the author had the opportunity to test the validity of this approach on nearly a hundred reliable sale instances. There are very few books dealing with these aspects of the development of an urban property. This book addresses these aspects but, does not deal with the issues involved in the process of actual construction at the site.

Valuation of a property requires the knowledge about the potential for development of the property. It involves a synthesis of the knowledge of urban land economics, law, town planning, architecture and engineering. Books on valuation are very few, particularly by Indian authors. The few that exist do not deal with the relevance of these aspects on valuation. There are no guidelines to assist professional valuers nor a standard code of practice. The cost approach adopted by most valuers to determine the fair market value of a property does not carry conviction. This book is the result of a careful and logical analysis of hundreds of sale instances and is backed by more than ten years' experience of the author as a valuer in the public sector.

Liberalisation of the economy tends to shift the emphasis of 'housing' to the private sector. There is a shift in the demand from *rule-based valuation to true real estate valuation. The need of the financial institutions to assess the requirements of funds for real estate development and the scope of pre-emptive purchase by the* central government (under the provisions of Chapter XXC of the Income Tax Act) started this shift. Market forces are expected to play a greater role in decision-making. Thus the emphasis is on the market condition and the decision-making of the buyer and the seller. The result is reflected in the sale instances. These are instances of facts. Thus the fair market value of a property is best derived from an appropriate analysis of the sale instances.

It is easy to outline the methods of valuation. However, the market value does not conform to any of the straightforward methods of valuation. This is evident from the innumerable sale instances. The following are some of the examples:

> A vacant plot of land was sold for Rs.15 lakhs whereas a property with an exactly similar plot of land with a newly constructed building of reproduction cost Rs. 5 lakhs on it, could not be sold for even Rs. 19 lakhs.
>
> A property in a commercial area fetching a monthly rent of Rs. 500 was sold for Rs. 25 lakhs.

When faced with such facts, some decision makers opine that valuation is an art; how can one be more precise about the value of a property when no two properties are alike? Such an opinion comes in handy to say that the value of a property depends on the purpose for which valuation is done. This argument is sought to be strengthened by the fact that real estate transactions are at arms-length (secret). "How can one value the properties based on sale instances of such transactions, particularly when the full price is not disclosed?", they say. To remove the cobwebs of such thoughts, we need to consider the nature of immovable properties. For effective communication of the concept of real estate, the vocabulary commonly used by the engineers, architects, valuers, developers and local authorities has been used in the book. Even these terms, abbreviations and symbols have been defined at the places they first appear. The ideas are reinforced in later occurrences in different contexts. The glossary at the end of the book helps to recapture these definitions in a nutshell.

Primarily the residential type is used to illustrate the application of the basic principles of real estate value. These principles are equally applicable for other types. Wherever differences occur, these have been explained.

Historically, when might was right, physical possession and the power to continuously hold it and defend the right through sheer physical strength was the basis of ownership rights. Even in a civilised society, the physical occupation of a property is recognised as the major proof of the right to possession. However, the right to the enjoyment of the property without let or hindrance is acquired through a legal process of acquiring the title to a property. In essence, the ownership of a property is a bundle of rights.

A large number of factors affect the land rate. The effects of many of these are interrelated. An analysis of the sale instances is a complex process. The divide and conquer rule is the best strategy to analyse a complex process. The locality, class of neighbourhood and the micro-environment are the primary factors affecting the land rate. Unlike a subjective analysis, a statistical analysis of the sale instances yields convincing results. It is then possible to derive the land rate from the analysis with an acceptable degree of accuracy of the results.

Intuitive decision-makers do not believe that a rational and logical analysis of the sale instances is possible. They emphasise that an individual buyer or a seller keeps his own counsel and rarely reveals his information to others. Any attempt to reconstruct his line of reasoning, from the mere facts of the sale instances, is considered by them as a futile exercise. It is argued that sale instances merely depict the past as it happened; even if a trend is discerned, it is not certain that the future will follow the trend set in the past. The results of successful analyses of more than four hundred actual and reliable sale instances analysed by the author proves the pessimists wrong. The characteristic increase in land rates does follow a trend, except during a short period of rapid changes in the rates.

Engineers and architects know how to estimate the cost. However, many do not know how to prepare an estimate of the value. Though cost is not the same as value, an estimate of the cost of reproduction of a building is often cited as the estimate of the value. Books on valuation explain the concept of value as distinct from the cost. Yet, they advocate the reproduction cost approach as practical to estimate the value.

Cost is a historical fact. It is fixed in amount. On the other hand, value is perceived. It is based on the utility. The value of an immovable property depends on its functional worth and the aesthetic beauty.

This book explains the economic aspects of the development of an urban property and the value approach to the valuation of urban immovable properties. Many valuers consider the characteristics of a property to prepare an estimate of the fair market value of a property. They assume that each physical characteristic contributes to the value. However, a characteristic is not the same as a benefit. The prospective buyer pays for the benefits. These are easily identified by asking the question, " What will it do for me?" This is the basis of the value approach to determine the value of a property. An immovable property may have a characteristic feature but the buyer may not want it. One values what he wants. The capacity to satisfy a want is the basis of the value of a property and determines its worth. The value of a property is its worth and is measured by the capacity of the property to satisfy the needs. Utility is the basis of value. A buyer is able to derive the benefit of the utility upon acquiring the property. It is the only approach adopted by a buyer to determine the value of a property.

A value depends on the perception of the individual buyer, according to his own need. It is difficult to put a definite quantity to the value of a property which is agreed by all. The concept of value is fundamental to the evaluation of a property. Thus it is necessary to quantify the value. This is facilitated by the precept, 'one has to pay the price for a thing which one values'. A price is generally associated with the market. This brings us to the concept of the market value.

The market value is the true measure of the value of a property. It is definite. It is no longer the personal opinion of an individual about the value of a property. It is the prevalent market price that a buyer must pay to acquire the property. It depends on the market conditions including the competitive sales. A market value is the price at which a property can be sold. The market value depends on the buyer and the seller since they constitute the market. A single sale instance does not establish the market. However, when several sale instances conform to the principles of value for deriving the market value, it is convincing. Thus it is possible to estimate the market value of a property, based on the sale instances of many properties. An estimate of the cost is based on the basic rates. Similarly an estimate of the value is based on the relevant basic facts which are ascertained from the market. The estimate of market value is based on the analysis of the sale instances. The process involves an analysis of the observed phenomenon to estimate the extent to which each factor affects the value of a property.

Buyers and sellers are the true decision-makers. Others, such as the financiers, insurers and the valuers merely attempt to reconstruct the decision-making of the prudent buyer. Primarily there are two styles of decision-making followed by the buyers and the sellers to put a monetary value on the property — the intuitive-authoritarian style and the consultative-participative style.

The intuitive-authoritarian style is characterised by intuition, experience, sound judgement and the rule of thumb. It scorns at formal analysis by valuation experts. The fear is that the analysis is tailored just to make a point. The opinions of the experts differ because there is no standard procedure for the analysis of sale instances. Thus the opinion of valuers often lacks conviction with judges and other decision-makers.

In the consultative-participative style, at least two persons are involved — the buyer and the seller. Each may have his own style of decision-making, but the process involves negotiation. The resultant style of decision-making is consultative-participative.

Apart from the two styles of decision-making, primarily adopted by the buyers and the sellers, there is the professional style. It is characterised by a systematic evaluation of all the factors contributing to the costs and the benefits. The belief is that the decision-maker benefits by consulting others; though in the final step, the decision is made by him alone. This style of decision-making is widely adopted by the decision-makers, such as the real estate investors, financiers and the valuers. The process is analytical.

Though the methods are different, all the three styles attempt to arrive at the price which is fair to the buyer and the seller. The analytical process follows the steps that a prudent buyer takes to arrive at the fair market value. The fair market value of an immovable property is the price that a prudent buyer would pay for the property in an open market.

The value approach is the same as the market approach. It is also the approach of the prudent buyer to determine the fair market value of a property. This book explains the value approach in the manner that is practical. Part 1 of the book comprises chapters 1 to 3. The contents of these chapters explain the principles of urban property development and valuation. It is based on the nature of real estate and its development. Part 2 of the book comprising chapters 4 to 9 explains, step by step, the value approach to determine the fair market value of an urban land, a building and a flat. Part 3 of the book explains the economic aspects of real estate development as a business.

A property is described by its physical characteristics. However, its value depends on the benefits that accrue to its owner. The right to receive the benefits from a property is valuable. Thus the value of a property is the value of the rights therein. Essentially, ownership is a bundle of rights. The ownership of a land is reflected in its possession. The value of a building is inherent in its utility. The transfer of a property really means the transfer of its ownership by an agreement in conformity with the provisions in the Transfer of Property Act.

A skill in the valuation of land requires the knowledge of the locality and its development potential; the prospective buyers; statutory laws (such as the Transfer of Property Act, Indian Easement Act, Contract Act, Law of Limitation, Tenancy Act and the Common Law on ownership, occupancy and transfer); local bye-laws and the manner in which they are actually implemented. Chapter 1 explains the nature of real estate and its market in the light of these aspects and outlines the essential features of an agreement to transfer an immovable property.

Often, people lay an undue emphasis on economising the cost of development of a land and on the building construction. Later they realise that the combined value of the land and the building does not equal the sum of the values of the land and its development. Generally urban land costs more than the cost of building on it. In a built-up property, the value of the land component depends on how it is developed. To realise its full value, an urban land must be developed in the most beneficial manner — irrespective of the cost. The development may be in phases. There is a need to shift the emphasis from economising the cost of development of the land to maximising the overall value of the land and the building. The value approach to the valuation of land and building helps to make such a decision. This approach is based on comparative sale instances of similar properties.

The utility of a land lies in its productivity. Thus productivity is the basis of the value of a land. It is based on the most lucrative and advantageous way in which the land can be developed. However, such a development is subject to Development Control Rules and Bye-laws of the local authorities. The Municipality, Corporation or the Developing Authority is the local authority. It is the authority to implement the Development Control Rules and the bye-laws. A bye-law is a law enforced in a particular area only. The objective is to maximise the benefit of the development to the owner and the community. Appropriate development of an urban land requires the knowledge of urban development; history of development in the locality and the city; Comprehensive Development Plan and Zonal Development Plans; Development Control Regulations and building economics. Chapter 2 covers these aspects.

The value of a property is the present worth of the future returns of income. Principles of valuation are evolved from the knowledge of the nature of real estate, its market and the development potential. Viewed against this background, it is easy to understand the principles of valuation behind most of the judgements of the courts. If valuation is based on the market alone, it can help to determine the correct fair market value of a property. It can then stand the test of any court.

Courts have outlined the principles of valuation. These are based on the understanding of the nature of a real estate and its development potential. Several case laws have been cited. Chapter 3 highlights the value approach and explains the principles of valuation.

Sometimes people wonder why the land rate in a particular locality is several times more than the rate in another locality in the same city. The very purpose of a property is to sustain the livelihood. The property must be near the place where one earns his/her livelihood or sustains his/her life. Thus the most important factor affecting the land rate is the locality in a city. This is also the main reason for the rapid increase in the land rate in a locality when the opportunity for earning the livelihood increases rapidly.

Though earning the livelihood is the most important preoccupation, one does not live by bread alone. The quality of urban life depends on the quality of the neighbourhood and the availability of appropriate civic amenities. People of different income groups have different priorities for each type of civic amenity. Proximity to appropriate civic amenities is the basis to divide a locality into different classes of neighbourhoods. The effect of civic amenities on the land rates in a locality is reflected in the classification of the neighbourhoods.

No two properties are alike; nor are they situated in the same location. However, they might be comparable in some respects. For the valuation of a land, the factors affecting its value are identified. The extent to which each of these factors affects the value is determined by analysing the trend. For comparison, courts insist that the properties be in the same locality. Each locality has different classes of neighbourhoods such as the high income group, middle income group and low income group. It is desirable that the sale instances from the same neighbourhood are compared.

The degree of accuracy of the data depends on the practicability of collection of such data. The accuracy of the results of the analysis depends on the purpose for which the results are used and the value of the information.

An estimate of the cost of a building may be made to an accuracy of about ten per cent. The subjective element input into the estimation of the cost of a building is much less than in estimating the fair market value of a land. Thus it seems appropriate to be satisfied with a similar degree of accuracy while deriving the fair market value of a property. The overall error should thus be within the limits of plus or minus five per cent. There are several major factors affecting the value of a property. It is enough if the effect due to any one factor is estimated within a margin of error of plus or minus one per cent. Suitable tables of coefficients have been developed to determine the effect of land rate due to a change in the width of the frontage, depth of a plot and width of public access road. These are based on the analysis of hundreds of sale instances in several major cities.

Chapter 4 gives a practical method to identify the localities, the classification of neighbourhoods, comparable sale instances and how to derive the land value from the sale instances and other data. The information is adequate to buy, sell or obtain finance from public and private housing agencies.

A building may be constructed with any combination of the specifications for its building components such as foundation, floor, walls, roof, doors, windows and the services. Different types of materials are available in the market for each building component. Each material has a cost and the capacity to satisfy the user's functional need, but to a different degree of satisfaction. If the alternative materials meet the functional requirements to the same level of satisfaction, a prudent buyer would prefer the specification with the lowest cost. A building component is worth so much as the lowest cost. The value or the worth of a building equals the sum of the functional worths of the building components. This is true if the specifications of the building components are integrated. The objective is to maximise the value to the cost ratio according to the requirements of the class of the prospective buyers.

The reproduction cost of a building equals its market value when the building is newly constructed to modern specifications according to the class of the neighbourhood. The prospective buyer of the building must be convinced that he gets his money's worth. The valuer has to identify the functions performed by each of the building components and calculate the minimum cost with which the functions can be performed. Functional worth is the minimum cost at which a function can be performed to the specified degree of satisfaction. It highlights the right combination of many proven facts and the processes to produce an assembly that is right for the job and at the minimum cost. This is precisely the approach of the prudent buyer. Thus we need to compare the cost approach of the land and building method with the value approach of the market to determine the fair market value of a built-up property.

Chapter 5 explains the method to derive the market value of a building from actual sale instances. It is based on the comparison of the performance specifications of the building with the standard specifications of the building appropriate for the class of the prospective buyers. Performance specifications required by a class of prospective buyers are indicated along with the corresponding technical specifications. The break-up of comparative costs of alternative products are indicated according to the functions they perform. The aspects which help to design a building for optimum performance are explained in Chapter 6. The value approach to determine the fair market value of a building outlined in Chapters 5 and 6 applies to valuation of flats and apartments too.

Architects evolve the design and brief specifications for construction of a building. These are based on the needs of the users and the owners. An architect's fee is about two per cent only. The market value of a building designed by a competent architect is more than the average value of similar buildings by about ten per cent. This is achieved by the architect by optimising the functional value of the utility functions and added aesthetics. Architects find it difficult to convince the clients (especially those in employment or trading) to pay the professional fees for the enhanced value of a scheme designed by the architect. The task becomes easier when the cost reduction (or the value addition) to be achieved is quantified on the basis of value analysis.

Based on the user's requirements, the architect prepares a sketch plan. He discusses it with the owner who in turn reveals his personal ideas and suggests some modifications. The architect explains his own point of view and then accepts the constructive suggestions. (After a few modifications, usually the owner is happy with the original plan of the architect, modified through repeated discussions). Value analysis helps to quantify the effects of the suggestions. It helps to come to a speedy conclusion which satisfies all.

The fair market value of a property depends on many factors. However, valuers cite only a few sale instances to derive the market value. The derivation is based on the assumption that the principles of valuation are unquestionable. In the absence of an analysis of adequate number of sale instances to prove these principles, the expert opinion lacks conviction.

Judicial pronouncements highlight the appropriate manner of deriving the fair market value of a property from sale instances. These are based on common sense. It is essential that any principle of valuation to draw an inference from the sale instances must be accepted by all -- only then is the sense common. A similar opinion has been expressed in the following extract from the judgement by the Gujarat High Court, in the case of Surya Kiran Association versus Appropriate Authority.

> Ordinarily a wide frontage should be considered as beneficial to the property than a narrow frontage. It is true that heavy traffic or vehicular pollution may adversely effect the property but then there must be some material or evidence on record on the basis of which, the appropriate authority may form an opinion by recording a definite finding to that effect. In the absence of such a finding or material on record, no inference can be drawn

of built-up properties, appropriate technology is the standard for comparison. Selection of the appropriate technology is based on the evaluation of the state-of-the-art technologies available. Chapter 11 outlines comparative informations on the state-of-art technologies. These informations help the investor in real estate to select the appropriate technology.

The principles and practices explained in the book were presented by the author in several seminars organised by the Institution of Valuers and the workshops organised by the National Academy of Direct Taxes, Nagpur and the Central Public Works Department Training Institute. It is hoped that practising architects, engineers and valuers will greatly benefit by the book. The subject has been dealt with a step by step approach. It is easy for even those interested in developing, buying or selling an urban property to benefit through an awareness of the issues vitally affecting them. It enables them to obtain the right advice from the architect, the engineer and the valuer and appreciate the same.

The annexures at the end are essential to a proper understanding of the subject and the practice of the valuation of immovable properties. The details in the appendices supplement the practical nature of the book as a manual.

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PART I

PRINCIPLES OF DEVELOPMENT AND VALUATION

Chapter 1

Nature of Real Estate and its Market

The nature of a real estate means its qualities and essential characteristic features. A study of the nature of real estate includes its physical, economic and legal aspects. The physical characteristics of a property are defined by its location, use, extent and the development potential. Engineering survey provides the basic data to determine these characteristics. The economic aspects of a real estate are concerned with its cost, benefit and value aspects. Cost is incurred to acquire a property. Benefits accrue after it is acquired. A benefit satisfies a need or a want of a person and he pays for it. Thus a benefit is valuable and demands a price to acquire it.

A market study determines the market value of a property. Once acquired, a property is owned and possessed. Ownership bestows the right to enjoy the benefit of a property. Enjoyment of the ownership rights of a property requires an understanding of the laws regulatingthem. A clear understanding of these aspects helps to visualise an immovable property as a bundle of valuable rights rather than merely as a physical entity with characteristic features. Such an understanding greatly helps to determine the correct fair market value of a property and its appropriate development.

NATURE OF A REAL ESTATE

An immovable property is a real estate. It consists of the land and buildings (if any) upon the land. Evidently these are fixed in position and hence are immovable. In the larger sense, land and any construction upon it (which is not movable) is an immovable property and hence is a real estate.

Nature of Land

Though land is everywhere, land suitable for development is rare. It is the latter type that is referred as land (throughout the book). It is the most basic resource and of highest value among all worldly possessions. Land exists in perpetuity and so does its value. No wonder, in comparison to its real value, the value of every other movable property pales into insignificance. The economic nature of land is defined by the following characteristics:

1. **High value of land:** The return of income from land is assured in perpetuity. The present value of a future income is obtained by capitalising the income. The capitalised value of an income in perpetuity is very high. It justifies the high price paid for a land. Of course, due to the very high level of security of income, a much smaller rate of return from investment in real estate is the norm (in comparison to the return from a business).

2. **Value of a land is inherent in its characteristics:** The characteristics of a property are converted into economic benefits by the development of the land or putting the land to use. The yield depends on the ability of the developer to put the property to its best use and realise its full potential value. Evidently each plot of land has only one possible best use.

3. **Productivity of land is dormant:** To be productive and income-yielding, land must be developed by investment on the infrastructure and the construction of a building.

4. **The high value of land acts as a hedge against inflation:** In an inflationary economy, land price increases with time. Thus it acts as a hedge against inflation and is suitable as a long-term investment.

5. **Ownership of a land is reflected in its possession :** To own is to possess. If a person owns a property, he can deal with it in any manner he likes, subject of course, to the laws of the country. Thus he may maintain, lease out, mortgage, sell or give away the property. Possession is a fact easily verified from an inspection of the property and its title. However, it is

difficult to ascertain encumbrances of a property, except those obtainable from the records with the registering authority. There may be a law-suit filed in the court by someone claiming a right on the property. There may be a physical encroachment or an illegal occupation by an unauthorised person. If no timely action was taken through the court, such encroachments practically curtail the enjoyment of the rights. These adversely affect the value of an immovable property.

Nature of a Building

A building is characterised by the utility inherent in its use. In fact, the utility of a land is essentially that of the building upon it. Since a building must provide the service, it has a functional value. This is the major component of the value of a building. The other component is the aesthetic value. The value of a building depends on its suitability for a particular use — commercial, residential, institutional or industrial. Unlike land, the value of a building depreciates with time due to wear and tear and also due to obsolescence. Thus every building has an economic life, after which it is profitable to pull it down and construct a new building of the modern type. The type of construction of a building greatly contributes to its value.

Value of an Immovable Property

To value an immovable property it is necessary to distinguish the benefits from the characteristics of the property. An immovable property may have several characteristics or attributes. Only a few of them may meet the requirements of a prospective buyer and be useful to him. These are the valuable benefits and contribute to the value of an immovable property. No benefit should be available free of cost if it is to contribute to value. Benefits are directly related to the physical characteristics of a property. Hence these cannot be speculative in nature, though the actual benefits may not be derived now but in future. There cannot be a benefit which is not related to a physical characteristic. It is the best to list all the characteristics and corresponding valuable benefits. An example is shown in Table 1.1.

A characteristic is always present in the property. However, a prudent buyer gets the benefits when he acquires the property and puts it to use. Benefits, expressed in action terms, are identified by answering the prospective buyer's question, "What will it do for me?"

Table 1.1
Benefits Versus Characteristics

Characteristics	Benefits
Characteristics which are benefits	
1. A bigger plot of land is sited on a wider road.	A large area of the plot and a wider road permits more floor area to be constructed.
2. It is a corner plot in the layout.	The double frontage permits better ventilation, sunlight and a grand front view. Easy access from two streets enhances its commercial potential.
3. The plot is in a developed locality	All civic amenities are available.
Characteristics which are not benefits	
1. A residential plot of land is with a frontage on a national highway.	The benefit due to a wider road is offset by theadverse effects of noise and risk of accidents.
2. A residential building is adjacent to the market	The benefit of nearness to the market is offset by the loss of privacy.
3. The windows are wider than required.	The marginal improvement of ventilation is offset by more sunrays entering directly into the room.
Characteristics that are benefits to some but not to others	
1. The land is very near a school.	It is a benefit to the middle and low income groups only. The high income group considers it as an intrusion into privacy.
2. The land is at a much higher elevation and is undulating.	It is a disadvantage to the low income group. Buyers ofa high income group prefer it for its exclusiveness.
3. A residential neighbourhood is in a business locality.	Proximity to business precludes it being a peaceful neighbourhood.

Valuers and surveyors acquire extensive information about the characteristics of a property. They erroneously presume that every characteristic of a property is a benefit to the prudent buyer and hence contributes to its fair market value. The real estate agents alone have the knack of acquiring information about the benefits.

In valuing a property, knowing its full description and the title is only half the job. The other half, which is more important, is to find the benefits that will accrue to the prudent buyer. It requires the knowledge about the market, the prospective buyer and his needs. The characteristics of a property cannot be changed. The valuer must carefully examine the attributes of the property and then identify the class of prospective buyers in the market and their needs. This is a pre-requisite to the valuation of a property.

Benefit is the Basis of Value

It is true that utility is the basis of value. Yet it is difficult to quantify it. Only some of the utilities yield economic benefits — not all. These economic benefits contribute to the value of the property. To derive the benefit, a property must be put to use. It is rare that a single use of an urban land can derive all the benefits. A different value accrues merely by changing the land use. If a property can be directly put to a use which can maximise its value after acquiring it, the price paid for the property is a reliable index of its value. Sometimes a further investment by way of development of the property for value addition is necessary to realise its full potential value. In this development process, apart from the value addition due to the development, there is a value addition due to better land use.

The value of an immovable property is the value of its ownership and occupancy. The rights of possession include the enjoyment of the economic benefits of a property, its maintenance and disposal. In fact, the value of an ownership follows from the enjoyment of the rights accruing from it.

Ownership is a Bundle of Rights

In a civilised society, the right to property is guaranteed by the constitution. Ownership rights include the rights to own, possess, occupy and dispose off a property. Transactions in real estates are regulated by the relevant laws. The important Acts are: The Transfer of Property Act, The Contract Act, The Limitation Act, The Urban Land Ceiling and Regulation Act and The Indian Registration Act.

The rights to enjoy a property and derive benefits from it are subject to the provisions in these and other relevant acts, the common law and customs. The Transfer of Property Act specifies what may be transferred, rights and liabilities of the buyer and the seller or the lessor and the lessee of an immovable property and the conditions for a transfer or an exchange. Agreements are drawn or vetted by members of legal profession as these have to stand the test of law, for enforcement.

Provisions in the Transfer of Property Act affect every individual in the society. Thus there is a sustained effort to explain the provisions of the Act and the case laws. It enables even non-legal professionals, such as valuers, to administer the provisions. The value of a property is based on the legal rights as outlined in the title deed or the instrument of transfer. It is necessary to ascertain the legal status of a property before any attempt is made to value the same. A title is acquired by descent, will, purchase or gift and is recognised as the proof of ownership. Thus the first requirement is to verify the title. Verification of the title and the conditions in the deed are entrusted to a member of the legal profession for investigation. Sometimes an individual comes into physical possession of a property without acquiring the title to it. It does not constitute the proof of ownership. Expert legal opinion is necessary to acquire the title to such a property. This is so, even if it is purchased or obtained from a person who was in lawful possession of the same. Except those through the courts, transfer deeds satisfying the provisions under the Transfer of Property Act and Indian Registration Act are required to be registered in the office of the Registrar or Sub-Registrar having the jurisdiction. No other mode of transfer of a property between private parties is recognised by law. Thus it is essential to know the features of such an agreement.

ESSENTIAL FEATURES OF AN AGREEMENT TO TRANSFER AN IMMOVABLE PROPERTY

In the Transfer of Property Act, the agreement for the sale or transfer of a property is referred as the 'instrument'. According to the Indian Contract Act, if an agreement is legal it is known as a 'contract'. The conditions of a contract are legally enforceable. The Transfer of Property Act stipulates that its provisions relating to contracts are taken as a part of the Indian Contract Act. There is no definition of 'instrument' in the Transfer of Property Act , except that it excludes a 'will'. Courts have opined that the 'instrument' is not only the evidence of the transaction but the transaction itself. The Indian

Registration Act stipulates that an unregistered document involving transfer of an immovable property cannot be admitted as an evidence. Thus a transaction is not complete until the document is registered. The status of an unregistered agreement is subject to the provisions of the Indian Contract Act. It is necessary to be aware of the provisions in this Act and the Limitation Act. An agreement not enforceable by law or prohibited by the provisions of any law is *ab initio* void.

What is an Immovable Property ?

The definition of 'immovable property' is not exhaustive in the Transfer of Property Act. It merely excludes standing timber, growing crops or grass and defines what 'attached to earth' means. The intention is to mean that any property which is not 'movable' but is 'attached to earth' is an 'immovable property' with the exceptions listed earlier. Thus items like fixtures, shelves and cupboards attached to the building constitute parts of the immovable property by virtue of the following definition:

i) It means embedded in the earth, as in the case of walls/ buildings; or

ii) Attached to what is so embedded for the permanent beneficial enjoyment of that to which it is attached.

Plants, equipment, machinery and fixtures attached to a building are sometimes sold through a separate agreement. These are excluded from the deed for the sale of the land and the building. If the items are attached to the building and are in operational condition at the time of sale, these form part of the immovable property. Courts have clarified this aspect further as follows:

> An object which is not remaining in position by its own weight but is attached to the earth and if detached will result in reduction of the aggregate value of the building and the fixtures taken together, is to be treated as a part of the immovable property.

By property, it also means any right therein. Sometimes, a doubt is raised that the title to a building can rest with one person while the title to the land on which the building stands can belong to another person. Courts have opined that there is no bar for a person to be in possession of the building alone, under a bonafide title or claim of title. However, he is only entitled, either to obtain compensation for the value of the building (if the land owner opts to keep the building to himself) or to remove the materials, restoring the land to its original state. Since the option is only with the owner of the land, it is appropriate to consider the immovable property in such a case to be the land together with the building. The possession of the building by someone else is then treated as a charge on the property due to the liability for compensation. A building is an immovable property and when the land is transferred, the building erected on it also passes by implication (even if the same is not expressly mentioned in the deed). Generally any sale of a building without a specific reference to the land (upon which it stands) does not convey the land alongwith it unless the interest of the transferrer in the land is exclusive and unrestricted. Thus ownership of a land and the building upon it can be with different persons provided there is a legal relationship between them.

Transfer of Property : What it Means

'Transfer of Property' means the 'act' by which a person conveys a property 'now or in future'. It includes the physical act of handing over possession of the immovable property in return for receipt of the agreed 'consideration' and registration of the deed of conveyance. If any interest in the property passes from one person to another, there is a transfer of a property. The words *'in future'* qualify the word '*conveys*'. Such a case arises in respect of a property not in existence now but likely to be ready for conveyance in future. The agreement for transfer of a property not in existence now, operates as a contract to convey the same in future and is specifically enforceable as soon as the property comes into existence. An agreement to construct a building and then hand it over along with the land, deals with a transaction relating to an immovable property yet to come into existence. A transfer and the deed of conveyance can be only of a property in existence. However, there can be an agreement to assign the interest in future. Registration of the undivided share of a land cannot be refused on the ground that the other agreement to construct a flat or a building is not registered. Of course, there are risks in such a transfer since the latter is not registered.

The transfer of a property begins with the Memorandum of Understanding and ends with the registration of the Deed of Conveyance and its delivery. The process includes the following activities:

1. Verification of the title by a member of legal profession.

2. Drawing up the agreement of sale.
3. Survey to verify the description of the property cited in the schedule of the title deed.
4. Inspection of the property to verify the conditions as specified in the agreement and to collect the details affecting its value.
5. Verification of the encumbrances and obtaining the encumbrance certificate.
6. Removal of encumbrances by the seller, if so promised in the agreement.
7. Payment of consideration and handing over possession of the property.
8. Preparation of the deed of conveyance.
9. Registration of the deed of conveyance.
10. Delivery of the registered deed.

Persons Interested in a Property

If an owner does not possess absolute ownership but has some legal rights to enjoy, he is said to possess merely an interest in the property. Transfer of properties includes even such transfers where only some rights are transferred.

The sum total of rights can be with one owner or it may be lying distributed with several persons — each with a part interest in the property. A person may lease out his property to a lessee for enjoyment of the property for a fixed number of years (twelve years or more). He may specify that the property shall revert back to him (even with all the improvements made by the lessee). Such a right to reversion is his future interest in the property. As the right is maintainable by law, reversion of the value of a land is real and valid. Provisions relating to the right to occupancy for a period less than twelve years exist in the Rent Control Acts and are not covered under the provisions of the Transfer of Property Act.

An agreement to transfer any right subsists merely as a contract until the deed is registered and the possession is handed over. The transferee does not acquire any rights to the property until the deed is registered. However, he can enforce specific performance of the contract in terms of the provisions in the Transfer of Property Act. It relates to a contract for sale to perform such acts as are specified in the contract and are legal. These include the right to get the deed registered and then acquire the right to the property.

What Can be Transferred

Any right to an immovable property can be transferred unless such a transfer is prohibited by any law of the land. Prohibitions are written in the Transfer of Property Act, Indian Contract Act, Urban Land Ceiling and Regulation Act, among others. If a person alleges that a certain right to a property cannot be transferred, the onus of proof is on him to cite the law. The Indian Contract Act provides that a consideration for an object is unlawful if it is forbidden by law or is of such a nature that it defeats the provisions of any law or is fraudulent or implies injury to another person's property or the courts regard it as immoral or opposed to public policy. Evidently, what cannot be legally transferred cannot be valued. If a person has no power to enter into a contract in respect of a certain property, such a contract is *ultra vires* but is not necessarily illegal. Thus an agreement for transfer of a property under the notion that the transferor has the legal title to the property is not necessarily illegal.

Description of a Property

The schedule attached to the title deed describes the property. Ideally, description defines what is being transferred. No other evidence of the identity of the property is required than obtained by comparing the description in the schedule appended to the agreement with the schedule in the parent title deed. In case of any discrepancy or ambiguity, the only alternative is to see the plan attached to the deed of conveyance. Errors in the description of a property do not annul the sale, but a suitable compensation is payable. The extent of compensation depends on the specific provision in the agreement to this effect. The rights in a property are elaborated in the conditions of the title deed. According to the Transfer of Property Act, even in the absence of a specific mention in the deed, all the rights that the transferor possesses and is capable of passing, get transferred with the registration of the deed. However, such rights, as are specifically excluded by mention in the title deed, do not get transferred.

The boundaries of a property are described in the schedule appended to the agreement for transfer. Often, the extent of the property is also mentioned. If the boundaries of a property are not in dispute with the owners of the adjacent properties, the extent of the property is defined by its boundaries. When the actual extent is *more or less*, the parties to the contract cannot raise a dispute, except for compensation. Such a compensation is not maintainable if the extent mentioned in the schedule is qualified by the words '*more or less*' or its equivalent. The qualification, '*more or less*' refers to a reasonable variation. It cannot be an excuse to misrepresent nor be a ruse to conceal encroachment.

The Indian Registration Act requires that the document relating to an immovable property must contain a description of such property sufficient to identify the same. It stipulates that houses in a town be described as situated on the North/ South/ East/ West side of the road in front. The name of the road is to be mentioned along with the house number and names of its present and past occupiers. Lands and other houses are to be described indicating the roads, abutting properties and existing occupancies. It further specifies that the description must also include a reference to the Government map or survey of the area (if such a survey map identifying the plots exists).

To eliminate the legal liability, it is the practice to use the same description of the property under transfer as in the parent deed. The description of the land as specified in the schedule is adequate for identification and hence for registration of the document. However, additional descriptions by metes (measures) and bounds (directions) are generally indicated for urban land due to high land rate. In this case, the boundaries are definitely fixed through land survey, establishing and indicating the area in units prevalent in the locality. If the boundaries are undisputed and the area within the boundaries is in the physical possession of the owner, the words, '*more or less*' are justified.

If a building or any other improvement has encroached onto an adjacent property, only so much land as is mentioned in the title is transferred along with the building on it. If someone else has encroached on the property, the extent of land in actual physical possession is mentioned in the description of the property, qualified by the words '*more or less*'.

Agreement to be in Writing and Legal

The Transfer of Property Act requires that the agreement be in writing. Any doubt on the legal status of a property can be clarified by an expert from the legal profession only. In case of a defective title or any legal encumbrance, it is very difficult to value the property.

Sometimes, a condition is incorporated in the agreement that the transfer is contingent upon the happening of a certain event which may occur on its own or through the effort of one or both parties to the contract. Such a conditional transfer fails if the fulfillment of the condition is impossible or is forbidden by law.

Date of Transfer

An agreement for transfer stipulates the sale price agreed (on the date of the written agreement) and the date on which possession is to be handed over. Sometimes there is a considerable lapse of time after the date of agreement and upto the date of registration of the deed. In such a case, doubts may arise as to the true date of the agreement and the date on which value of the property is to be determined. In terms of the provision in section 53A of the Transfer of Property Act, the date of taking over possession of the property by the transferee (in terms of the agreement) and doing part performance of the contract (by doing some act in furtherance of the contract) is binding on the transferor. If there is evidence of such an act (as payment by cheque and its encashment) and of taking over possession, the date on which the value of the property is fixed is taken as not later than the date of handing over and taking over possession. It is not necessary that a condition must exist in the agreement regarding handing over possession.

Time for Completion of Transfer

For the sale of an immovable property, the Transfer of Property Act specifies that time is not the essence of the contract, unless it is specified or can be so inferred from the contract or the circumstances of the case. However, the Indian Registration Act provides that the document must be presented for registration within four months from the date of its execution.

Essential features of an agreement to sell an immovable property are at Annexure 1.1 and a sample form of deed of sale is at Annexure 1.2

NATURE OF REAL ESTATE MARKETS

Buyers, sellers and the properties available for sale constitute the market for an immovable property. Valuers often consider the property alone to determine its value. However, demand and supply regulate the market value of a property. The economic, social and legal setting in which the real estate is located, determines its market value. Any changes in these, as also changes in their interpretations by the courts and enforcing agencies affect the value.

Characteristics of a Real Estate Market

The following are the characteristics of the real estate market:

1. **Supply of land is limited:** Lands suitable for being developed economically are scarce. This is due to the high cost of investment involved in developing the infrastructure. The development of a locality takes years and involves a huge investment by the public agencies and the property owners. As the development proceeds, the number of vacant lands decreases. The limited supply of urban land is unable to match the ever rising demand. This is the major reason for the high value of land in a developed locality.

2. **Market is local:** The location of a property is fixed. Hence its market is local. It is generally limited to the town or the city in which the real estate is located. The high value of land limits its market to those who can afford it. Persons with similar ethnic background and profession prefer the same locality. They have similar levels of income. Thus the classification of localities is based on these factors. The ethnic background and the levels of income of the inhabitants is generally a rough guide to the class of prospective buyers.

3. **Each land use has a different demand:** Lands are used for different purposes — residential, business, instituioinal, industry, and agriculture. Depending on the society's requirements, the demand for each of these categories is different at a given point of time. Changes in the political, social and economic setting in a locality affect the real estate market.

4. **Market is unorganised:** In the absence of a centralised agency for real estate development and marketing (such as the Delhi Development Authority), the market is highly unorganised. It is very susceptible to variations in demand and supply. When a sharp and sustaining increase in demand occurs, property prices shoot up to a very high level because the supply cannot match the demand in the short time.

5. **Trend of real estate business follows that of general business:** The real estate market is affected by the changes in business activities in a city. The trend in real estate business follows the trend in general business as it happened in Mumbai, during the financial year 1993-1994 following the liberalisation of economy.

6. **Real estate transactions are confidential:** The buyer and the seller meet in confidence and establish credibility before entering into any agreement for sale. Often, there are considerations other than the monetary value. It is difficult to obtain all information relating to a sale. However, an intelligent valuer, well versed with the local market, can easily analyse the sale instances to discern reliable patterns and trends.

7. **Transactions are free and fair in an open market:** A transaction in real estate takes a long time to mature and a further long spell of time before the document is registered. Thus it is appropriate to consider such transactions to be in a free and fair market. An immovable property cannot be sold immediately without causing a substantial loss. It is termed a distress sale. Such a sale instance is not suitable to derive the fair market value of a property.

8. **Persons with similar levels of income acquire properties in the same class of neighbourhood:** An immovable property is fixed in location. It is the neighbours and the neighbourhood who contribute to its value. Any investment on improvement or development in the neighbourhood or the locality affects the value of the land. Hence, the saying, '*the three most important factors which affect the value of an urban land are location, location and location.*' A prospective buyer of a property in a high income group neighbourhood, rarely considers properties in a middle income group neighbourhood for purchase. The real estate market in a locality is segmented into different classes of neighbourhoods according to the market values of the properties. It is appropriate to consider the demand and supply for each class separately. Thus the analysis of sale instances in the same neighbourhood alone is appropriate. However, it is not always possible to find adequate number of sale instances in the same neighbourhood. A broader analysis can reveal the differences in the land rates among different classes of neighbourhood. Such an analysis is used to derive the

land rate of a property from sale instances in other classes of neighbourhoods.

Market Value, Fair Market Value and Assessed Value

Market value is determined by the price fetched in a market. The price depends on the urgency of the purchase for the buyer, his capacity to pay and the availability of other properties. Evidently, demand and supply regulate the price. The market may be restricted, as in a controlled economy or open as in a liberalised and market based economy. In an open market, there is a willing buyer and a willing seller. There is no element of compulsion. The buyer has the option of buying or not buying. He buys if he considers it prudent to do so. The fair market value of a property is defined as the price a prudent buyer would pay for the property in an open market.

Sometimes the value of a property is assessed to determine the tax on it. It is done according to the rules prescribed in the act. These rules merely ensure that all properties are assessed for tax on a rational basis to avoid discrimination. The assessed value is not necessarily the fair market value.

For acquisition of a property the fair market value is appropriate. In a free market economy, the true value of a property is the fair market value. It is the monetary value which is fair to the buyer and the seller. It is not necessary to identify a prudent buyer. It is enough if all the aspects that a prudent buyer would consider are taken into account and the appropriate method of valuation is adopted. In an open market, with no restrictions or pressures on the buyer or the seller, the monetary fair market value of an article is the price at which it is sold. Thus the fair market value of a property is quite often equated to its selling price. Before giving such an opinion, the valuer must look at the transaction closely. He must ascertain whether any restrictive or hidden conditions existed in the transaction or in the market condition at the time of the irrevocable sale agreement.

Fair Market Value is Fixed by Comparison

Land rates in a locality tend to catch up with the highest while those in a neighbourhood tend to equalise. Sellers invariably compare the land with the one which fetched the highest land rate in the neighbourhood. Ascertaining the reasons why purchasers pay so much money to buy the properties is the best market survey to list the valuable benefits of a property. Apart from considering such benefits, majority of purchasers go into the next step of analysing them. They compare the property with the sale instances of similar other properties. Such a comparison is not 'feature for feature' but as income from alternative benefits. Often a characterisitic that is considered as a benefit by one class of buyers is considered as a loss by another class. Thus it is necessary to identify the appropriate class of prospective buyers and their needs before selecting comparable sale instances. In making a sale, the real estate agent focuses his attention on the reasons why the vendor wants to sell the property and the reasons of the purchaser to buy the same. While analysing the sale instances, it is helpful if the valuer is aware of these reasons. If there is a distress sale or a forced purchase due to some special reasons, it is best to ignore such a sale instance.

Unique Selling Proposition (USP)

Often a property has a special benefit for the prospective buyer which may be considered as its unique selling proposition. Price preference is the most common USP. Another example is the location of a property in a neighbourhood, it is the prestige. In a building, it is the aesthetic features. These affect value. Sometimes, a buyer is prepared to a give a preference over other comparable properties but is not prepared to pay a higher price for it. Such USPs increase the market size and saleability but not the value of the property. Some of these USPs may have a value to an individual but not to the class of prospective buyers. It is best to ignore such value additions while fixing the fair market value of a property.

CONCLUSION

It is easy to collect the details about an immovable property and determine the benefits from the physical attributes. Enjoyment of the benefits from a property is subject to the legal provision. The legal status of a property is evaluated with respect to the provisions in the Acts. Market value is the true test of the value of a property. However, a real estate market is rarely well established and each transaction is at arms length. There is an acute paucity of information on such transactions.

Since the stakes are high, merely the opinion of a valuer is not adequate for an investment decision. A step by step approach based on sound principles of value is the best analytical tool in the hands of the valuer. Establishing the definition and the legal status of a property is the first step. The potential for best possible development and use of a property is the basis of its value. Thus the next step is to know how to develop an urban land.

SUMMARY

An immovable property is a real estate. Its nature is defined by its physical, economic and legal characteristics. Land and the income from it exist in perpetuity. A property has several characteristics. Only a few of these are benefits and these contribute to value. The value of an immovable property is the value of its ownership and occupancy rights. The ownership is described by its title, possession, encumbrance and occupancy. To own is to possess. Thus the ownership of a land is reflected in its possession. "Physical occupancy is nine-tenths of possessions, in law ," is the popular saying. An encumbrance reduces the value of a property. The latter is determined by the loss of income-earning capacity.

The fair market value of a property is the price that a prudent buyer would pay for it in an open market. Sometimes, the value of a property is assessed to levy tax on it. The assessed value is determined according to prescribed rules. Fair market value is appropriate for investment or acquisition of a property. It is derived from comparable sale instances because similar properties in the same class of neighbourhood tend to fetch the same price. To identify the class of a neighbourhood, the emphasis is on the class of prospective buyers — *not the present neighbours.*

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Chapter 2

Development of an Urban Property

Everybody strives to increase the quality of life. Cities provide a better quality of life than in small towns and villages. The upwardly mobile strata of the society manages to acquire urban properties. They are motivated by the entrepreneurial nature to develop their own urban properties in a manner that would maximise the benefits and yet limit the cost of development. To achieve the twin objectives, it is necessary to understand the economic and legal aspects involved in developing an urban property. Moreover, the value of an urban property cannot be determined without an understanding of these aspects.

An urban property is developed through investments on the property by the owner, on the neighbourhood by other property owners and on the locality by the local authorities. When there is a greater co-ordination among such investments, property values appreciate greatly. To maximise the return from an investment on the development of a property, the owner must be familiar with the city development plan for the locality and the nature of real estates in the neighbourhood. The development plan of a locality envisages the civic requirements of the property owners and the nature of development of the locality suitable for them. Knowledge of the basis of the essential provisions in the city development plan and development control regulations is helpful. It enables the owner of an urban property to plan for its development. The prime objective of planning for development is to maximise the value of the developed property. The other objective is to minimise the cost of development. Knowledge of building economics and value engineering helps to achieve economy in the cost of development without reducing its value.

DEVELOPMENT OF A CITY

Urban development is dynamic. It depends on investments by the private and public agencies. A sudden growth in investments in a city or a locality is spurred by a shift in investments in business, industry and real estate. It creates an opportunity for employment. This opportunity is the prime factor for the migration of population to a city. Continuous investments in a locality puts a relentless pressure for change of land use from 'agricultural' to 'industrial' and 'residential'. As the business activities continuously increase, the demand for change of land use to 'commercial' picks up. Evidently a city is like a growing organism. For good health and quality of life of its inhabitants, the development of a locality needs to be channelised to maximise the benefits. This is the basis of planning for urban development. It requires an in-depth knowledge about the locality, nature's bounties upon it, composition of the community and human relationship with regard to the social, economic and political activities. The Master Plan of a city is studied in this background. It is a plan of the projected development of the city in an orderly manner. The emphasis is on controlling the land use and to ensure the development of civic amenities and infrastructure such as transport and communication, health, education and recreational facilities.

Transport and Communication is the Key to Development

Investments by public authorities are for infrastructure and the civic amenities. Town planning aims to keep the total cost of such investments to the minimum. Transport and communication are the prime necessities because people need to interact with each other at the places of work and in the residential layouts. Business activities account for most of the travel. To keep such travels to the minimum, planners keep the areas with commercial activities together. Similar is the case for institutions and public offices. An efficient transport and communication system is the hallmark of these zones.

To limit the travel from the place of residence to the place of work, the residential localities are generally located adjacent to the zones with commercial, public or industrial land uses. No wonder, property values greatly depend upon the availability of frequent and economical transports. The need is acutely felt, particularly during the rush hour traffic. Residential localities require a different set of civic amenities. A peaceful neighbourhood is a prime necessity. Keeping the residential localities separate from industrial and commercial zones assures a peaceful and healthy living. An excellent educational facility is another prime necessity. A decent residential locality develops near an institutional locality.

Development of a Locality

Generally the origin and the development of a locality are based on the economic considerations. It may be the employment opportunity in the locality or the nearby industrial, commercial or public locality that sustains the development. To forecast the development of a locality, the potential for future growth of the economy in the locality is projected. An economic survey of the locality obtains information about investments in business and real estate and the distribution of population according to the per capita income. Density of population, its growth and migration are of particular interest. These informations are obtained from the census reports. Other informations, such as the origin of a locality and the phases of its development, are obtained from the locality itself.

Phased Development of a Planned Locality

State Governments have constituted city development authorities. These authorities acquire lands in the notified areas and develop them as town planning schemes or development schemes. Development in such a planned locality is in phases, covering a limited area in each phase. A recent development has modern buildings. Lands in such a neighbourhood fetch better prices. Thus the phase of development is an important index to classify neighbourhoods. Lands in the developed areas and in the areas within the boundary of a municipality or a corporation are ready for building construction. Hence the lands in such areas are more valuable than the lands in an undeveloped locality.

Development Beyond Municipal Limits

Lands beyond the jurisdiction of a local authority are developed by the private sector. The pace of development depends on the demand from the buyers, their paying capacity and the level of development in the adjacent locality within the municipal limits. These permit the buyers to start construction of buildings in the land adjacent to the already developed locality.

Civic Amenities are within Municipal Limits

Civic amenities greatly contribute to the quality of urban life. These are provided by municipal and local authorities. Civic amenities include transport facilities, parks, playgrounds, recreational facilities, educational institutes, hospitals and dispensaries, religious buildings, community halls, post and telegraph offices, police stations, libraries, public utility service buildings and service utilities.

The plan for urban transport facilities indicates the detailed information on the pattern of flow of traffic, intensity of peak hour traffic, parking areas, bus stations or depots and suburban railway network.

Information for the civic amenities of particular importance for the development of an urban property relate to the availability of adequate power, water supply, sewerage, telecommunication facility and their distributions.

Local authorities provide civic services to all lands within the municipal limits. These services include public roads, footpaths, drains, water supply, sewerage, electricity and telecommunication. Thus the growth of localities within municipal limits is faster than in outlying areas. Localities with better civic amenities grow still faster. Some areas grow so much that they develop into city centres. Lands near city centres are the most prized possessions. These attract most people to invest further in the area. Thus in city centres the city grows upward. Developers buy lands suitable for development for real estate business in such areas. Alternatively, a developer enters into an agreement with a land owner for joint development of the land. They construct a multi-story building to realise the full potential value of the land by utilising the permissible floor area ratio to the full extent. It is the ratio of the total covered area on all floors to the area of the plot.

CITY DEVELOPMENT PLAN

Every large city has a city development plan, often known as the Master Plan. Under the Town Planning Act, a State Government notifies a region for development and defines its limits. For planning the development and use of the lands in this region, it constitutes a Planning

Authority. The Authority prepares a development plan. For this purpose it carries out a survey of the city. The survey includes geographic, demographic, economic, and social aspects of major resources and amenities available in the area. The development plan specifies the manner in which the lands in the area should be used, developed and the stages of such development. Thus it specifies the following:

1. Maps showing the permissible land uses of all the lands in the region so that the land use of each plot of land is fixed.
2. Proposals for location or relocation of population, industry and commerce in different zones (Relocation is considered necessary if the existing land uses endanger public health and safety).
3. Reservation of areas for infrastructure, open spaces and recreation.
4. Preservation, conservation and development of natural resources and objects of heritage.
5. The development plan is not a standard for each region but has a strong regional characteristic (based on the style of living of the population in the region).

Apart from the foregoing aspects, a city development plan indicates the following:

1. Detailed plans for development of specific areas for urban renewal, housing, shopping centres and service industries.
2. Control of development of each plot for individual or group housing, such as the permissible floor area, ground coverage, number of stories, setbacks of buildings and the number of dwelling units on each plot of land.
3. Areas of bad layout, slums and relocation of population.

A city development plan is prepared considering the existing land use and the trend of future development. Once approved by the State Government, a development plan is not revised until at least ten years later. Forrevision, a fresh survey is carried out and a new map of existing land use is prepared. Thus the city development plan is the most important document referred before formulating alternative proposals fordevelopment on a plot of urban land. Maps are prepared showing the existing and proposed land uses and developments.

A city development plan outlines the evolution of different localities with respect to population, housing, slums, civic amenities, public and semi-public buildings, economic activities, traffic and transportation, land use, planned zones and zoning regulations.

The population densities are based on the last census report. The phase wise projection of the population in different localities is indicated upto the end of the planned period. Area wise distributions as high, middle or low income groups are also indicated. The information on slums includes their location, density of population, slum improvement and schemes for their re-location. The information on economic activities includes the details about the location and concentration of commercial centres, market complexes and the type of business in these areas. The information on industries indicates separately the areas for small scale and medium industries. The distance to the location of heavy industry, if any, outside the city is indicated.

DEVELOPMENT CONTROL REGULATIONS

To ensure a planned development of the city, the Town Planning Authority prepares the Master Plan and the document incorporating the development control regulations. These rules prescribe the type, extent and manner of development permissible for each plot of land within the limits of the city development plan. The essential details are indicated in the form of Tables in the development control regulations. Typical examples are shown in Tables 2.1, 2.2 and 2.3. The Local Authority ensures that these rules are followed by all. For this purpose, the city is divided into zones and planning districts.

Zonal Classification Based on Population Density and Level of Control

The natural growth of a city means that some localities are more densely populated than others. If the growth of an already densely populated area is not controlled, it may lead to a severe strain on the civic amenities. In some sensitive areas, it may be essential to have a strict control on the future development. The development plan contains a map showing the areas of different intensity of development. It is based on the density of population and the level of congestion. A separate set of development control rules is provided for each zone. Often a road is the boundary between two different zones. Properties on both sides of this road, upto one property depth on each side, are treated as the one with more intensively populated area.

Comparable sale instances must possess a similar development potential. Thus they relate to the same set of tables showing details of permissible development. It follows that the boundary of a locality, with comparable land values, must wholly lie within a single zone.

Land Use Maps

Urban lands are classified as residential, commercial, public or semi-public, institutional, industrial and agricultural zones. These are based on the existing land use and the civic amenities available in each neighbourhood. The permissible land uses for all the lands in a locality are shown in the map of the planning district. When mixed uses are permitted in the ground floor of a building on a site, the regulations of the predominant use of the land or the building is considered. It is desirable to mark such mixed land use areas as a separate neighbourhood. The actual land use permissible in each of the zones -- residential, commercial, public or semi-public, industrial and agricultural — are indicated in the development control regulations. Typical uses are indicated in Table 2.1.

Table 2.1
Uses Permitted in Different Zones

Sl. No.	Land use Zone	Typical uses permitted	Other uses with special permission
1.	Residential	Residence, hostel, dharmashala, school, public service office, clubs, semi-public recreation, neighbourhood shop and doctor's/ professional's chamber.	Public office, restaurant, bank, public utility building, college, personal service e.g. barber, tailoring, nursing home and Service industry with a maximum power upto 5 HP.
2.	Commercial (Retail)	(In addition to residential and other uses, with special permission) shop, business office, store, hotel, restaurant, cinema, theatre and service industry with power upto 10 HP.	Automobile workshop, garage and industry employing upto ten workers and power upto 20 HP.
3.	Commercial (Wholesale)	Same as in the case of retail business zone and service industries with power upto 20 HP. However, residential buildings are not permitted.	Same as in the case retail business zone but with power upto 50 HP and hospitals. residences are not permitted.

Public and semi-public buildings include places of assembly of the public, government, local bodies and the utility buildings. The extent of development permissible is different for each zone.

Permissible Ground Coverage, Height and Floor Area Ratio

The width of access road and the size of a plot of land are the limiting factors which determine the permissible maximum limit for the following : number of dwelling units that can be constructed on a land, the percentage of land area that can be covered by the ground floor, the floor area ratio and the height of the building. These are specified in the form of Tables in the document specifying the development control rules for different types of land uses such as residential, group housing, row housing, commercial, public and semi-public including places of assembly or worship, high rise buildings, industrial, transport and communication. Typical details for a residential zone are indicated in Table 2.2. The regulations specify the limits for basements and parking.

Table 2.2
Permissible Ground Coverage, Floor Area Ratio, Height and Number of Dwellings in a Residential Zone.

Sl. No.	Type	Min. Area of plot (Sq.m.)	Min. width of road (mtr.)		Min. frontage (mtr.)	Maximum Permissible Development			
			Congested Locality	Non-congested locality		F.A.R.	Ground coverage (ratio)	Dwelling units	Height (mtrs.)
1.	Single dwelling	100	4.5	6.0	6.00	1.00	0.60	1	8.00
		250	6.00	9.00	12.00	1.25	0.50	2	8.00
2.	Multiple dwelling	665	6.00	9.00	12.00	1.50	0.40	6	12.50
3.	Row house, single	100	3.50	9.00	4.50	1.00	0.66	1	8.00
4.	Row house, multiple	210	4.50	9.00	12.00	1.00	0.60	3	12.50
5.	Semi-detached house	310	4.50	9.00	8.00	1.25	0.50	3	12.50
6.	High-rise	1500	-	18.00	24.00	1.75	0.33>	10	24.00

Evidently lands with the same type of land use alone are comparable. Permissible land use and development control regulations are not retrospective in effect. The existing development is allowed to continue without interference. However, any addition or alteration must conform to the new regulations.

Setbacks of Building Lines for Light and Air.

Buildings require light and air circulation to facilitate human activities. Each building is setback on all sides from the boundary of a plot so that there is adequate air gap between adjacent buildings. The minimum setbacks on the front, rear and the sides are determined from the Tables in the Development Control Regulations. Typical details for residential buildings are indicated in Table 2.3. The extent of the front and the rear setbacks depend on the length of the plot perpendicular to the access road. These setbacks, coupled with the widths of the roads at the front and the rear ensure better light and air circulation than due to the setbacks on the sides.

Table 2.3.
Minimum Setbacks for Residential Buildings Upto 12.5 mtr. in Height.

Depth of site	Front & Rear setbacks		Width of site	Side setbacks	
	Front	Rear		One side	Other side
upto 12	1.50	1.50	upto 12	1.50	1.50
over 12 upto 18	3.00	1.50	over 12 upto 18	1.50	3.00
over 18 upto 24	4.50	3.00	over 18 upto 24	2.50	3.50
over 24	5.00	3.50	over 24	3.00	4.00

(Numbers indicate the lengths in metres)

DEVELOPMENT OF A PROPERTY

In the developing economy of a country, inflation is inherent. As the Wholesale Price Index increases, real estate prices also increase. If money is to be received not now but in future — its present worth is less. The present worth is calculated by discounting the amount to be received in future, at the current rate of interest (which otherwise would have been earned, if the money was readily available). The value of a real estate continuously increases as time passes on. The rate of future income from it also increases. The present worth of such a continuously increasing income offsets the effect of inflation. This is true for urban lands. If a land is with a building, the effect is reduced due to the depreciation and obsolescence of the building greatly contributes to depreciation. In a developing locality, there is a continuous effort to improve the specifications for future construction of buildings. Older buildings have some components with obsolete specifications. These adversely affect the value of the land and the building. The cost of construction of a building is kept neither too high nor too low as compared to the value of the land.

A building reflects the picture of the lifestyles of its owner and the occupant. It affects the quality of life. In this respect, a building aptly makes a statement to the outside world about the status of its owner and the occupant. It affects the income earning capacity of the property. It can be planned as a growing house by future additions. However, the original construction should not become even partly obsolete during the prime of its life. Otherwise, the building is an encumbrance on the land.

The value of a land increases as the development of the neighbourhood grows. In the initial stage of development of a locality, it is best to keep the land vacant. This is so, as long as the value of the land increases at a rate higher than the rate of inflation. Such a judgment is made considering a period of several years (to correctly understand the trend).

BUILDING ECONOMICS

Building economics provides the appropriate background for the various assumptions involved in the preparation of the economic feasibility of a development project and the evaluation of project alternatives. It deals with both cost and value aspects. While there are excellent studies on the cost of construction, there are very few reports on the value analysis of completed buildings. An engineer is an expert on planning and estimating the cost of construction. He is well versed with cost studies. Similarly a valuer is well versed with value aspects.

Since Value Analysis deals with cost and benefit aspects, valuation of a property and its development requires the knowledge and the database available with the planning engineer and the valuer.

Economic Aspects in Design

The major considerations in the design of a building are—the purpose for which it is to be used and the aesthetic value of the building. The extent to which the functional and aesthetic values can be maintained over the whole economic life of a building determines the level of excellence achieved in the design. These aspects are dealt in Chapters 5 and 6. If the building does not serve its intended purpose very well, its value is greatly reduced and the design is utterly uneconomical.

High value addition occurs when an appropriate technology (consisting of materials and processes) is adopted. Cost of construction also depends on the technology. The construction technology must be appropriate considering the materials available in the market and the skills of available labourers.

The study of cost-benefit analysis in the design stage involves the study of cost and value analysis of building materials and processes.

Architectural design

The gross developed value is maximised if a property is so developed as to fully satisfy the performance requirements of the owner of the property. The market value is maximised if it meets the requirements of the prospective user and the buyer. Knowing the client's requirement, the architect fully utilises the benefits of the site according to the local bye-laws. He may assist the client in specifying the client's requirement. The requirements of spaces for various purposes are ranked. The architect works out several alternative arrangements to meet the purpose effectively. Once the final spatial arrangement is accepted by the client, the building form is evolved out of the purpose. It alone is appropriate and cost effective. Alternative plans are evaluated based on the planning efficiency and the shape efficiency. The former is the ratio of the work area (excluding the area of walls and passages) to the total plinth area. The latter is based on the optimum area of the building envelope. The planning efficiency of a semi-detached house is about six per cent less than for a multi-storeyed non- load-bearing apartment; that for an independent and detached house, it is ten per cent less.

An attempt to minimise the cost of construction requires a thorough understanding of the cost planning aspects. The type and size of the development project is fixed as a part of the client's brief. These depend on the level of investment which the developer is prepared to commit. The size can then be determined, knowing the all-in plinth area rate for the type of construction.

Engineering design and specifications

These are based on value engineering concepts. The objective is to minimise the cost and maximise the benefits. Often the development is for profit (such as in a real estate development business). For this purpose, alternative feasible schemes are prepared, evaluated and the optimum is implemented. Knowledge of building economics is a pre-requisite to estimate the cost of construction. The details required for the development of an urban land are indicated in Annexure 2.1.

Building Bye-Laws

The building bye-laws regulate all building activities within the jurisdiction of the local authority. These include the Development Control Regulations and Laws to regulate the design and construction of buildings. No new construction, addition or alteration of a building can be taken up without obtaining a prior approval of the local authority. The permit is valid for a fixed period only. The bye-laws specify the general building requirement, such as, required characteristics of the site, means of access, open spaces for light and ventilation, parking space, parts of a building, services and structural safety. The bye-laws relating to parts of a building specify the minimum requirements based on the functional requirements. Often these refer to the provisions in the National Building Code.

To check whether the proposed construction conforms to all the building bye-laws, a local authority requires submission of a set of documents as specified in the bye-laws.

Documents to obtain Building Permit:

1. Specified form (duly filled in).
2. Key plan (scale 1:10000) for approval of layout plan of the area.
3. Site plan (scale 1:1000) showing the description of the site.

4. Building drawings (scale 1:50 or 1:100) explaining the proposed construction.
5. Details of building services including plans (scale 1:100) and specifications.
6. Ownership documents (including all clearances from the legal authorities and the lessor).
7. No Objection Certificate for proposed land use, from the Compe tent Authority under the Development Control Rules (Master Plan).

Preliminary Estimate of cost of Construction

In the absence of details about actual cost, a preliminary estimate is based on the rates in the accepted tenders for similar works. Alternatively, a preliminary estimate is prepared on the basis of accepted plinth area rates for a base year and the cost index for the year of construction. Based on the cost analysis of selected buildings already constructed, the plinth area rate for each type of building is ascertained for a base year. The cost index on the basic plinth area rate as on that date is assumed as 100.

With the passage of time, the rates of labour and materials increase. To determine the increased cost of construction of the same type, the cost index is calculated considering the enhanced basic rates of a selected set of materials and labour, which contribute maximum to the overall cost. A suitable weightage is given to each item of material and labour depending on its contribution to the overall cost. The requirement at this stage (when even the sketch plans are not ready) is merely for a preliminary estimate of cost. The purpose is to obtain the client's commitment to the likely expenditure. Any estimate of a future event is approximate. For the preliminary estimate of cost, an overall and all-inclusive cost index is appropriate (see Annexures 2.2 and 2.3). The Central Public Works Department approves periodically the cost indices for various cities of India. Alternatively, the details may be collected from the statistics of the wholesale price index published monthly.

The rate per unit quantity of each item of material and labour prevailing in the market on a particular date in a city is indicated in the column 'Base Rate'. The product of the base rate and the quantity contributes to the weightage of the material or labour to the overall rate for construction. To calculate the cost index at a later date in the same city, the corresponding rates at site on that date are listed. The ratio of the rate at the site on the later date to that on the base date is multiplied by 100 and divided by the weightage for the item. The resultant number is a component of the cost index. The sum total of the components is the cost index on the later date.

How to Determine Development Potential of an Urban Land

The following are the steps to determine the development potential of a plot of urban land :

1. Identification of the class of locality and the class of neighbour hood (as indicated in paragraphs 3 and 4 of Chapter 4, Valuation of Land).
2. Inspection of the locality andtheneighbourhood to list the permissible and possible types of development and theextent. This is done considering the development control regulations and the present and the future requirements of the owner.
3. Sketch plans of alternative development schemes are prepared (based on building economics and appropriate technology).
4. Evaluation of alternative schemes (based on cost-benefit analysis).
5. Identification of the scheme to ensure the highest value (based on the best possible use of land).

Planning for development of an Urban Land

The planning for development of a plot of urban land involves the following steps:

1. Performance specifications are listed according to the owner's needs and requirements.
2. Technical specifications are evolved from the performance specifications.

3-5 Steps 3, 4 & 5 are similar as in the corresponding steps to determine the development potential as listed in the preceding paragraph. Standard specifications of building of different types and the corresponding plinth area rates are considered. The evaluation of specifications is based on Value Engineering.

6. Brief specifications of the building scheme finally selected are written as a part of the preliminary design and the preliminary estimate.

7. A preliminary estimate is prepared.

ECONOMICS OF DEVELOPMENT OF A LAND

The cost of development is optimum when the combined value of the land and the development is maximum. Thus the optimum cost of development of a land bears a certain ratio to the value of the land. The ratio depends on the market values of developed properties in the locality. In the initial stages of the development of a locality the highest rate of value addition occurs through an investment on the development of infrastructure. In a fully developed locality with an adequate demand for flats, the highest value addition is due to a development by construction of flats. It is unwise to restrict the investment on the development of a land to an amount less than the optimum. In such a case, the development may prove to be an encumbrance to the realisation of full value of the property. This is particularly so, if further development is not possible. Examination of the economic aspects of a proposal for development of a land requires the knowledge of the value of land.

Thus the next step is to understand the principles of value and the methods of valuation.

SUMMARY

The objectives of planning the development of an urban property are to maximise the value of the property and minimise the cost of development. To achieve the twin objectives and to value the property, it is necessary to understand the economic and legal aspects of development. People need to interact at the places of work and in residential layouts. Property values greatly depend on the availability of frequent and economical transport. A healthy and peaceful neighbourhood is a prime necessity in a residential locality. The origin and development of a locality are based on economic considerations. The development of the locality is in planned phases. Thus the phase of development is an index to classify a neighbourhood. Lands beyond the municipal limit are developed by the private sector. The pace of development depends on the demand from the buyers, their paying capacity and the level of development in the adjacent locality within the municipal limit. Maximum value addition due to development of land, in such an undeveloped area, occurs due to infrastructure development. Localities with better civic amenities grow faster. Some of them develop into civic centres and attract the maximum number of

people to invest further. In civic centres, the city grows upward. Thus it is most profitable to invest in the construction of flats in such areas.

A City Development Plan and the zonal development plans for the planning districts outline the permissible development of lands in a locality. In the initial stage of development of a locality, it is profitable to keep the land vacant — as long as the land rate increases at a rate higher than the rate of inflation. If a building does not serve its intended purpose, its value is greatly reduced. The proposed building must satisfy the performance requirements of the owner. The building form is evolved out of the purpose for which the building is intended to serve. It is evaluated on the basis of efficiency of the plan and the shape. Engineering design and specifications are based on Value Engineering concepts. The cost analysis is based on accepted tenders for similar works. Alternatively, a preliminary estimate is prepared on the basis of the approved plinth area rates and the all inclusive cost index for construction.

To determine the development potential of a land, alternative schemes are prepared, based on building economics and appropriate technology. These are evaluated on a cost-benefit analysis. The best scheme shows the development potential of the land. The performance specifications are listed; technical specifications are evolved; brief specifications are outlined for the finally selected project; and a preliminary estimate is prepared.

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Chapter 3

Principles of Value and Methods of Valuation

The concept of the fair market value is perhaps as old as civilisation itself. It is inherent in the process of barter which characterised the earliest economic activity. In the modern Indian society, the first attempt to codify it seems to be in the Land Acquisition Act 1894. While delivering judgments in cases relating to acquisition of properties or levy of taxes on immovable properties, courts have done a commendable job in interpreting the concept of fair market value. It was based on a logical and analytical approach in each case. Often, sale instances were analysed as a part of the procedure to determine the fair market value of a property. The concept was further consolidated when 'fair market value' was defined in the direct tax laws such as the Wealth Tax Act and the Capital Gains Tax Act. This latter step however, introduced many extraneous factors leading to ad hoc and empirical laws to determine the fair market value.

The concept of fair market value is universal. The provision in chapter XXC of the Income Tax Act relating to the purchase of immovable properties by the Central Government has recognised this golden principle.

An appropriate procedure for valuation evolves out of a thorough understanding of the principles of value and the methods of valuation. Devoid of such an understanding of the integrated principles, determination of the fair market value of the property tends to become subjective. It cannot stand up to scrutiny.

In the era of economic liberalisation, real estate development is in predominantly in the private sector. Since the stakes are high there is a premium for determination of the correct fair market value of a property, based on sound principles of valuation.

Valuation is primarily concerned with the concept of value. It is necessary to understand the nature of immovable properties and *how they affect the value*. The latter concept is referred as principles of value. In this context, a principle is a fundamental truth, a law or a doctrine on which other concepts are founded or conclusions drawn.

A method of valuation outlines a procedure. In this context, principles mean the settled and accepted rules of action. Whichever method of valuation leads to the determination of the correct fair market value of an immovable property is the most appropriate. Courts have laid down the principles of valuation. These settled rules for valuation are contained in the judgements of the High Courts and the Supreme Court and are cited as Case Laws. An integrated approach to their understanding, in the context of their applicability under the market conditions, is essential.

PRINCIPLES OF VALUE OF A PROPERTY

A buyer willingly pays a very high price for a land because it is the means to his livelihood. Homestead lands are primarily meant for development for habitation. Civic amenities are the primary factors affecting the land rate in a residential locality. As a city grows, the emphasis placed by the prospective buyers on the additional civic amenities such as avenues, parks, proximity to market and civic centre, coupled with their desire to be identified as living in a particular locality, determines the market value of land in the locality.

Generally a small part of the public investment in a city is in a locality — a still smaller part of it is in a neighbourhood. However, large investments are made in public, semi-public, institutional and industrial areas. Thus adjacent localities have higher land rates.

Next in importance to locality is the location of the property within the locality. This is due to economic considerations as reflected by people's preferences for certain locations such as a decent neighbourhood, adjacent to a park, a corner plot or a plot near the neighbourhood shopping centre. Site particulars of the land matter less if the property has already been developed and is in use. Otherwise, to determine the best possible use of land, alternatives may have to be considered, keeping in view the physical factors and the Development Control Regulations. Thus, the third important economic characteristic of land is physical — size, shape and orientation.

A land has several characteristics yielding economic benefits. The prospective buyer sees the land as a bundle of attributes. The price offered by him for the land is the sum of the values of each of these attributes. The amount depends on his buying motives and the extent to which he can benefit from each of the attributes. Engineers often fail to distinguish between the characteristics of a land and the benefits that they may bring to the prospective buyer.

The immovable property market is sensitive to changing buyer perception and the gradual change in the class of the neighbourhood due to a few nouveau-rich who buy properties in the neighbourhood with potential to develop it into a high income group neighbourhood. They develop the properties with substantial investment for constructing high class buildings. The original owners (who could not invest huge amounts for development) find it more attractive to sell the land and move to a locality suitable to their present needs and status. Even a few purchases at higher rates pushes up the land rates in a neighbourhood thus changing it from Middle Income Group to High Income Group. Soon the land rates in the adjacent neighbourhood also increase.

No two properties are alike in all respects. However, they might be comparable in respect of certain important characteristics which affect their values. It is then easy to derive the value of one property by comparing it with another. The method of valuation based on comparative sale instances is the most preferred one. For this purpose, courts insist that the locality of comparable sale instances must be the same. In fact, it is desirable that even the neighbourhood should be the same or of a similar class. This is because the demand and supply position is distinct for each class, as is evident from the discussion on the nature of real estate markets dealt in Chapter 1. Thus properties comparable in physical features and in the same neighbourhood tend to fetch similar prices. The concept of value is further elucidated by the following principles:

1. **Value of a property depends on the title and conditions in the title deed.** The value of a property depends on the title and conditions in the title deed. It means the value of the rights

therein. It depends on the title and the conditions in the deed of conveyance. A division of the ownership rights of a property among two or more individuals means mutual obligations. The sum total of such rights merely equals the full ownership rights. Reduction in value due to the division of rights depends on the nature of encumbrance affecting the value of the rights owned by each individual. In the case of a lease hold land, all restrictions imposed by the landlord on the use of the land are taken into account in valuing the rights of the lessee. These restrictions do not allow the property to be put to its highest and best possible use. Similar is the case for values of undivided shares of a property and for tenanted properties. Value depends on the terms of the sale. Enjoyment of the rights is subject to the provisions in the Acts. Under the provisions of the Rent Control Act, occupancy rights are not transferable. Thus an occupancy right, by itself, has no legal market value.

2. **Value of a land or a building depends on the purpose for which it is used.** Land is used for residential, commercial, institutional, industrial or agricultural use. The rate of return from investment on each type of land use is different. Thus the value of a land depends on the purpose for which it is used. An owner invariably wants to use it for a purpose which will maximise the return. Often, such a use comes in conflict with the welfare of the society. Though we use the term full ownership rights for free hold land, its enjoyment is subject to the legal provisions. These include land acquisition, city development plan, local bye-laws and tax liabilities. Local bodies have framed bye-laws to regulate the land use and the manner of its development with a view to maximise its benefits to the owner and the community. These greatly affect the value of an urban property.

3. **Land value is based on the most lucrative and advantageous way in which the land can be put to use by a prudent buyer.** The objective is to realise the full potential value of the land consistent with the local bye-laws (but not by mere speculation or by an impractical scheme). The permissible and potential land use greatly affects the value. A land which can be used for building purposes must not be valued as an agricultural land. Similarly a plot of land which has commercial potential has added value as compared to the residential use.

4. **Market value depends on locality.** The market of immovable properties is segmented as high, middle and low income groups. The market value of an immovable property is derived from comparable sale instances of lands in the same locality or in a locality of the same class.

5. **Properties in the same neighbourhood and comparable in size and physicalfeatures fetch the same value.** Land rate depends on the class of neighbourhood. The length and width of a plot of land, its topography and the width of access road are the physical features of the land. These affect the land rate. Evidently land value equals the product of the land area and the land rate. The value of a building also depends on its size and physical features such as the materials of construction and the workmanship.

6. **Market value varies with time.** Phases of boom and slump of real estate business follow similar phases of general business but with a time lag. It is appropriate to compare sale instances in the same phase only. Land value generally appreciates with time. On rare occasions, it may decrease due to a serious sustaining social turmoil. Time greatly affects value.

7. **Value depends on the income-yielding capacity.** This is particularly true for properties meant for commercial use.

8. **Market price is not a conclusive test of the real value in every case.** Fair market value is dependent on the perception of the prospective prudent buyer. It is different from the actual seller's price or the buyer's price.

9. **The value of a property depends on its development potential.** The potential depends on the development control regulations.

10. **Cost is not value.** Historically costs are incurred to convert waste lands to make them suitable for agriculture. Later, as the city grows, the agricultural lands in the periphery of a developed locality are further developed at additional cost for industrial, residential or commercial use. It is natural that this cost is reflected in the value. However, cost cannot equal value, except in rare cases when there is an adequate supply. Demand and supply greatly affect the market value of a property. Thus the value of a developed land, even in the outskirts of a city, does

not equal the cost of agricultural land plus the cost of development. Similarly the value of a built-up property does not equal the value of land plus the cost of construction of the building. The value of a building depends on the perception of the prospective buyer about the valuable benefits that will accrue to him. Thus an appropriate market study is essential for valuation of an immovable property.

11. **Value depends on demand and supply.** The real estate market is local in character. It means that the market forces operating in a city are unique to itself. Since real estate is fixed in location, the market price is extremely sensitive to even small changes in local demand and supply. In the upswing, the effect of any imbalance between demand and supply on the market price of land persists till the supply tends to be equal to the demand at a particularly higher price level.

    In the case of a higher demand for flats, the higher rate, persists till a large-scale construction meets the additional demand. Similarly in recession, it takes quite some time for the developers to dispose off the properties already developed or under construction. It is easy to determine the extent of housing shortage from the census and other records. However, a shortage does not necessarily lead to an additional demand. Only a discerning eye can notice the slow and subtle changes in the business environment which have a great potential to cause a change in the local demand for real estate. The single factor which spurs the change is the shift of capital funds to or from the city. Such a shift may also take place within the city itself from general business to the real estate business. It is necessary to identify the factors affecting such shifts so that the duration of the rise or fall of real estate business in the cycle can be predicted.

12. **Demand depends on who buys what, when, where and why.** A demand is created when a need arises. The first step to define a demand is to identify the class of prospective buyers and what they need. The demand for real estate in a city is best understood by closely examining the real estate and business environment in the city. Knowledge of the real estate environment yields useful information such as who buys what, when and where. Premises are required for a business or a

residence related to a business. Real estate business is led by the general business cycle.

Information about the past sale instances in different localities in the city is the best source to ascertain why people buy the properties in a particular locality at the stated price. It helps to forecast the demand. In normal times supply equals demand. Generally a steep rise in demand is due to a change in the business and industrial environment in the country as a result of the changes in the financial policy.

The leading indicators of real estate business environment are the following:

- **Share prices.** A steep annual rise in the general index of industrial production and prices of shares in business concerns is followed by an increase in land rates.
- **Money market.** An excess of savings ultimately finds its way to the real estate business. A liberal money supply sustains it. In a market with tight money supply, there is little real estate business as all available funds are mobilised for general business which yields better profits.
- **Price index.** A steep annual rise in the inflation is indicated by the rise of the wholesale price index and the consumer price index. The effect of the former on the land rate is great.
- **Tax and other incentives.** It is a deliberate policy implemented by the Government to give a boost to housing.

National level indicators merely indicate the general business environment. Of particular interest are the indicators of real estate business in a city and a particular locality. The rapid rise in the price of real estate in a city or locality is generally due to the following reasons:

(i) Shifting of business and industry to a city. It provides opportunities for employment.

(ii) Shift of population to or from a city or a locality. It follows from the step 1 cited above because people shift residences for employment or business.

(iii) Increase in wage levels. This isfollowed by an enhancement of rent in the city. When the wage levels increasefor a particular income group, the rents for the corresponding type of accommodation increases. Consequently, the land rates in the corresponding class of locality increase due to the increased demand.

(iv) Revision of the development plan of the city and the bye-laws. It results in the revision of the zonal classification of the localities to a higher class.

(v) Approval of projects to provide vastly improved civic amenities. Civic amenities provide the quality of city life. There is a greater demand for properties in localities with better civic amenities. Provision of civic amenities spurs the development of a locality.

13. Land value depends on the level of development of a locality. Vacant lands in a developed locality are very few. Still less are the number of properties available for sale. There is no reason why a person having a property in a developed locality would sell it, except at a very high price. Thus the land rate in a fully developed locality is very high.

The demand for real estates is maximum in a developing locality with a high growth potential. There are many vacant sites. The demand for vacant sites is always more than for built-up properties. Thus the land rate of a vacant land is generally more than the component of the land rate of a built-up property.

A recent phenomenon is the rapid increase in land rates of big size plots in suburban areas within a driving distance from the city. Vary high income group purchasers buy such plots of land for residence in a cleaner locality, though underdeveloped. The cost of development of such lands is much less than the increased cost of lands within municipal limits. The phenomenal improvement in telecommunication and information technologies has made it possible for rich people to live in cleaner localities and yet have access to modern life-styles.

In case of rising demand, the locality with the highest land rate is the one to attract more buyers till it reaches a peak land rate. The high demand then shifts to other localities of potential high growth. Thus the information who buys, what, when, where, how and why is very valuable to estimate the fair market value of a property. This information is available from past sale instances.

14. **Value depends on the nature of development and the return on investment**. Investments in a real estate by a person is due to his desire to assure financial independence through uninterrupted income. The quantum of value addition due to an investment on the development is reflected in the yield of income. Keeping an urban property without use does not yield any return. However, its market value keeps on increasing due to inflation.

    Instead of an outright sale, a land may be leased out on a long-term of twelve years or more to fetch a yearly ground rent. If the property was sold and the amount deposited in a bank in long-term deposit, the return on investment would be the rate of interest which is marginally higher by about one to two per cent than the rate of long-term inflation. Such a step would yield the net return on investment as one or two per cent only. In case a property is leased out, the increase due to inflation goes to increase the market price of the property but is not available as income during the period of lease. To offset for this loss of income, the ground rent from lease is generally higher than the net return from the long-term deposit with banks after deducting the rate of long-term inflation. The higher rate of return accounts for the effort in managing the property and covers the risk.

    The lessor's risk is less when a land is leased out for development by the lessee by constructing a building on it. The return on investment in such a case from secured ground rent is marginally less by about one per cent than when it is unsecured. The percentage of return on investment depends on the permissible type of best use of land, the city in which it is located and the type of locality—residential, commercial or industrial. Since the lessee develops the property, he receives the benefits of such development and passes on a part of it to the lessor by way of ground rent.

    The greatest benefit accrues to an owner by realising the income from the land and yet retaining the property with him instead of the lessee. The effect of building construction is not only to give adequate return on investment on such constructions, but also from the land value by putting it to a better productive use than merely leasing it out.

Often the choice is between keeping the land vacant and investing on it to get a return not only on the building but also from the land. The latter option is preferable when the percentage return on investment is atleast marginally higher than the combined return from the investment on the building plus the equivalent return from ground rent alone. Thus the return on investment from land and building is higher than from secured ground rent. The extent depends on the expected net rental income from the property.

The return of investment from land and building depends on the type of best use of the property and the stability of the income. Thus the rate of return depends on the type of the property, the class of neighbourhood and the city in which the property is located. A list indicating the expected percentage return on investment from each type of land use is prepared from actual sale instances of tenanted properties. These are also the rates of capitalisation to determine the fair market value of a property by Rent Capitalisation Method.

When a building is constructed for the purpose of return on investment only, it is a real estate business. Every attempt is made to utilise the full development potential of the land. If the construction of a multi-apartment building alone can utilise the full permissible floor area ratio and the venture is profitable, this alone is the appropriate development of land. The return on investment from such a business is higher than from the land and building method described earlier. The difference accounts for the business entrepreneurship including the element of risk in business.

15. **Value of a leasehold property.** Properties leased for a period of twelve years or more are covered under the provisions of the Transfer of Property Act but not under the Rent Control Act. The total value of the property due to absolute ownership is shared between the owner and the tenant. The division is in proportion of the value of title and possession plus the capitalised value of rent to the value of occupancy less the capitalised value of rent. Evidently, the value of occupancy is based on the capitalised value of the estimated market rent of

the property while the capitalised value of rent is based on the actual rent being received. In case of leasehold property, the total value of land and building estimated by land and building method is apportioned between the lessor and the lessee. Sometimes, in a lease covered under the Transfer of Property Act, it is provided that the land together with any developments made on it by the lessee, shall revert back to the owner at the end of the lease period. The present worth of such a reversionary right is known as reversionary value and it is added to the capitalised value of the lease rents to obtain the value of a leasehold property as the value of the lessor's interest in the property.

PRINCIPLES OF VALUATION

Principles of valuation, as they relate to a procedure mean well settled rules for consistent action. The objective of the procedure is to determine the correct fair market value of a property. The procedure involves ascertaining the facts from the data collected, analysing the data and drawing the right conclusion.

A rational analysis of objective data is more likely to yield the correct fair market value than the subjective opinion of a valuer. The rational analysis is founded on principles of value.

Case Laws

The principles of value and valuation outlined in the preceding paragraphs are supported by several case laws. Extracts of relevant case laws are in Annexure 3.1. The detailed analysis of hundreds of actual sale instances of immovable properties indifferent cities of India as discussed in Chapter 7, also validate these principles. There are several methods of valuation. The method appropriate in a particular case depends entirely on the relevant objective data and the corresponding appropriate principle of value. To decide the principle of value applicable, it is necessary that the nature of the property is correctly defined. The latter helps to determine the type of data required. Of course, the data must be objective, reliable and based on facts. If the data itself is based on a guess, an estimate or an opinion, it cannot lead to the appropriate method of valuation.

METHODS OF VALUATION

Valuation of an immovable property is in two major steps. Since the ownership of a property is a bundle of rights, the first major step is to define the title, the rights and their owners (if there are more than one). Enjoyment of the right to occupancy is the most valuable right though it is not transferable. Thus the first question to be asked to determine the appropriate method of valuation is, "Is the property occupied by the owner or is it occupied by a tenant in legal occupation?" When the property, its valuable benefits and their distribution are defined, the second major step is to quantify the value of the benefits from the property. This is based on the principles of value. The value of a property depends on the purpose for which it is used. This criterion is useful to decide the method of valuation applicable in a particular case. The following are the methods of valuation to determine the fair market values of properties :

A. ***Methods based on comparable sale instances***. Properties comparable in nature and principles of value are valued by the same method. The fair market value of a property is derived from comparable sale instances by adjusting the value according to the appropriate method. The methods are:

   1. Comparable Sale Instances Method.
   2. Land and Building Method.
   3. Income Yield Method
   4. Development Method
   5. Belting Method.

B. ***Prescriptive/statutory methods***. These are based on rules specified in the appropriate Act.

   1. Rent capitalisation method
   2. Profit method

METHODS BASED ON COMPARABLE SALE INSTANCES

1. Comparable Sale Instances Method

Comparable sale instances are identified from the same locality and with similar permissible and potential use. The value of a property under consideration is derived from these sale instances. Suitable adjustments are made for the differences in values due to the attributes of the property being different from those in the comparable sale instances. The rate of addition or deduction for value is based on an appropriate analysis of all the sale instances in the locality. A locality has different classes of neighbourhoods. A lower income group neighbourhood does not necessarily mean a lower land rate because blocks of different groups who share the same neighbourhood amenities tend to have the same land rates. The maximum difference in land rates due to physical features such as frontage and depth of a plot (including the effect of return frontage on corner plots) is about twenty per cent. It means that the variation from the average land rate is about plus or minus ten per cent. The maximum difference in land rates in a particular neighbourhood is about fifteen per cent. It includes the effects of location, width of road and physical features. Thus the maximum difference in the land rates in a locality with different classes of neighbourhoods is about fifty per cent. The spread of a locality is limited by two factors — the walking distance (say two kilometres) to common civic amenities and the variation in land rates. The latter is limited to about fifty per cent. It is based on the difference between the land rates in the lowest and the highest classes of neighbourhoods.

Value of a commercial or an industrial property: Investment in a commercial or industrial property is made for the purpose of income. In such a case, the fair market value of a property is derived from comparable sale instances of properties in the same neighbourhood with the same class (H.I.G, M.I.G or L.I.G) of business. A sale of a business or an industrial property is rare. It may be a distress sale or due to some pressure. The market rent is a good guide to the relative value of a commercial property because income is the basis of investment in such a property.

It is easy to ascertain the market rent for a property correctly. Thus the comparison of the market values of properties according to the market rents of commercial properties is appropriate.

'Comparable Sale Instances' is the best method: A seller invariably bases the price of his land with reference to the sale instance with the highest land rate in the neighbourhood. If such a sale instance does not exist in recent times, he bases it on the highest land rate in the locality. A method which relies on the data that the buyer and the seller considered while fixing the price of the property is the best method. The real estate valuer must develop the insight into the property transactions and follow the same steps to decision- making as the prudent buyer.

2. Land and Building Method

This method is appropriate for valuation of owner-occupied properties with newly constructed buildings. It is generally adopted for the purpose of acquisition of a property because the owner can readily hand over vacant possession of the property. The reproduction cost of a properly designed and newly constructed building equals its value. This method is applied even for a property with an old building, if the value of the building component is less than fifteen or twenty per cent of the total value of the property. (The specified per cent is in conformity with the generally observed 'Pareto Principle' and is consistent with human behaviour). In this method, the reproduction cost of the building is added to the value of the vacant land. The sum is the fair market value of the built-up property.

If the value of the building component is more than fifteen per cent, it is derived from sale instances of properties with the similar class of buildings. For this purpose the value analysis concept of Value Engineering is appropriate.

Value of a building: People buy to benefit. Benefits accrue when a building is put to use. The value of a building is due to its functional and aesthetic values. To convince a prospective buyer that he gets his money's worth, the real estate valuer has to determine the functional and aesthetic requirement of the class of prospective buyers and evaluate the functional worth of the building against these. An integrated set of building specifications based on value engineering concepts is listed for the type of building required by the class of prospective buyers. The specifications of the building should be of the highest standard consistent with the class of prospective buyer. Considering the actual specifications vis-a-vis the standard, the market value is derived by adjusting the standard plinth area rate for the difference.

Depreciation of the value of a building

The value of a building depreciates due to use, forces of nature and obsolescence. If a building ensures the highest and best use of land, its depreciated value is obtained from the following straight line formula:

V = C (r + s) where,
V = depreciated value of the building
C = reproduction cost of the building
r = ratio of future economic life of the building to its total economic life
s = ratio of salvage value of the building to its reproduction cost

The future economic life of the building is estimated. The total economic life is based on the economic life of buildings with the standard specifications for the appropriate type such as H.I.G, M.I.G or L.I.G. Economic life takes into account the established fact that in a developing economy, more buildings are torn down thanfall down. The physical or chronological age of the building is of some help in assessing the future economic life. However, it should under no circumstances be taken as the past economic life for determining the extent of depreciation. What we need to determine is the Functional Worth of the building as it exists.

Actual sale instances do not corroborate the straight line formula for depreciation. In the case of recently constructed buildings, the used ones fetch less value than those unused. The value of a building is attributed to its structural, functional and aesthetic utility. While the economic life of a structure may be 60 to 80 years, it is 30 to 50 years for services and 2 to 5 years for some items of finish such as paints which affect the aesthetic value. Annual maintenance and periodic repairs do not restore the value of a structure depreciated due to aging but restore the value of services and aesthetics partly. Emphasis is on the present condition of the building and its services. It is difficult to determine precisely the anticipated future economic life of a building which is two or three decades old. In such a case, the Functional Worth of the existing building components need to be evaluated. Of particular importance is the building services, considering their present conditions for utility in comparison to the satisfaction provided by new ones. Detailed analysis of the building value based on reproduction cost, depreciation and value engineering concepts is necessary if the depreciated value of the building is so high as to affect the decision to purchase. However, land value is often the major component of the value of a property. In such a case, the accuracy of the value of the building based on plinth area rate and depreciation is enough. The universal 'Pareto Principle' of 80:20 is appropriate to decide which of the two procedures may be followed in a particular case. If the component of the land value is eighty per cent or more, the straight line formula for depreciation of the building is appropriate.

When salvage value is appropriate: When a building has outlived its economic life it is economical to pull down the building. This releases the full value of the land. What is salvaged is the value of the dismantled materials. This is known as the salvage value of a building. The value of a property considering the salvage value is appropriate when the difference between the depreciated value and the salvage value is an insignificant per cent of the total value of the property. It is also appropriate when the prudent buyer is most likely to pull down the old building to realise the full development potential of the land (to utilise the full floor area ratio permissible by constructing flats). In such a case, the land value is compared with the value obtained from the development method. It is worked out on the basis of the correct rate for flats in the neighbourhood. The land rate worked out by development method must be significantly higher than the one worked out from salvage value of the building. Otherwise, there is no incentive to undertake development by constructing flats. In such a case, the land value is worked out by considering the following :

a. Depreciated value of the building
b. Salvage value of the building
c. Development method.

Land rate is determined from the best consideration from the point of the prudent buyer.

Value of a building under construction: Generally the value of a new building equals its cost of reproduction. Similar is the case for a land with a building under construction. The sum of the value of the land encumbered with the incomplete building and the reproduction cost of the building under construction is the fair market value of the property. If however, the building is not appropriate, considering the value of the land, it is best to consider the salvage value of the building under construction.

3. Income Yield Method

When a property is tenanted, the tenant cannot be evicted and the tenanted property cannot be redeveloped. The owner's rights are then limited to the title and the right to receive the rent. The latter accounts for the major part of the value of a tenanted property. The net income is calculated by deducting the expenses from the rent. The value of the property is obtained by capitalising the net annual income. To this is added the value of the title to obtain the fair market value of the property. This method is adopted when the income is appropriate and sale instances are very few. Even then the value is compared with the sale instances of similar properties. Rent capitalisation method is appropriate in a neighbourhood with a large depreciation of values, but not in a newly developing neighbourhood.

Value of a property occupied by a tenant: When a property is let out on rent, the right to occupancy constituting a major portion of the bundle of rights in the property, lies with the tenant. The tenant cannot be evicted, except in terms of the provisions of the relevant Rent Control Act and the tenancy agreement.

Rent Control Acts provide conditions for eviction of the tenant and also for redevelopment of a property. Due to such provisions, it is invariably observed that the price fetched by a tenanted property is much higher than the amount calculated by capitalising the net rent. In estimating the market value of a rented out real estate, it is appropriate to compare with the sale instances of similarly built-up and tenanted properties. The value may also be compared with that obtained from development method. The Rent Control Act provides for redevelopment, real estate developers often buy such tenanted properties and develop the same to the extent permitted by the local bye-laws to realise the full potential value. Thus sale instances of similar tenanted premises are comparable.

4. Development Method

The development method, as the name implies, is based on the actual method of development of land adopted by real estate developers. It may be considered as an extension of 'Land and Building Method' in the sense that the value of land is derived from the value of the proposed scheme with land and building.

Built-up properties: The developer buys up a plot of land, constructs a building on it and then sells it to someone who needs a ready-built property. This method of valuation is appropriate when comparable sale instances of built-up properties are available.

Plotted developments: When there is a ready market for small size plots of land but none for a very big plot of land, a real estate developer may find it most lucrative to buy up the large plot of land, develop the same by laying out the roads on it and divide it into smaller plots with independent access to the roads. Thus, with minimum additional investment he is able to realise the full development potential and value of the big plot of land. For urban land in the periphery of the town, this method is more appropriate than the belting method. Additionally, the developer may provide other infrastructure facilities such as water supply, sewage disposal and electricity. In such a case, it is appropriate to estimate the total price at which all the resultant small plots of land can be sold at the present market rate and deduct from it the cost of development to arrive at the value of the land itself.

Group housing: Local bye-laws regulate the development of individual plots of land in urban areas. Zonal development plans and local bye-laws permit different types of land use and floor area ratios depending on the location, size of plot and road width. Unlike small sized plots suitable for individual housing, large plots are suitable for group housing. The higher value of a large plot of land due to higher permissible floor area ratio can be realised only through investment by the owner or a real estate developer. The land is developed by building upto the full permissible floor area and selling the same in parts or the whole. Such a development is taken up on the basis of a carefully formulated technical and economic feasibility study. The permissible floor area ratio and super-built area are ascertained with reference to local bye-laws and standard type plans for such flats and typical multistoried buildings. The essential inputs to such a feasibility study are the market rate per square metre of the building to be constructed and the cost of construction. Usually, such investments are very high. Even a small error in estimating the market rate per square metre of saleable building to be constructed or the cost of construction can lead to a large error in estimating the value of the land. It is essential that economic feasibility be based on correct market rates and not on mere speculation. Land rate from development method should also be compared with sale instances of similar properties even in other localities. The comparison is based on land rates obtained by development method in such localities with actual sale instances of flats and lands with similar development potential *vis-a-vis* the land rate for smaller plots. To consider the nature of assumptions and their effect on determination of the fair market value by Development Method, it is necessary to know the nature of real estate development business. It helps to estimate the correct cost of development and its value.

Joint development: Sometimes a large plot of land is developed through the joint investment of the landowner and the real estate developer. The landowner transfers a certain percentage of undivided share of the land to the developer and permits the developer to invest money in constructing a multistoried building in the entire land. The landowner and the developer agree to share the super-built area of the building in proportion to the value of their relative investments. If the values declared are reliable, land rates may be derived from such agreements for joint development. Alternatively, knowing the land rates, the percentage of undivided share of the land that may be transferred to the developer can easily be calculated if the cost of construction and the market rate of flats are ascertained. Developers make use of the Development Method of valuation of land to make an offer for purchase of a land for development and making profit. Whichever mode of development is currently in vogue, values of a land are worked out by all such modes of development and the one which gives the highest value is adopted as the estimated land value (provided the relevant facts and details have been ascertained to be correct). If the assumptions in the particular type of development are not susceptible to verification and such assumptions affect the land value significantly, such a method is not reliable.

Evidently, Development Method is not appropriate in a town where no such developments have been taken up as yet. Belting method is then the only alternative to value large plots of land on which several rows of smaller plots are possible.

Belting Method: In rural and semi-urban areas, where road facility alone is available, the rate is calculated by the belting method. The land rate for the second belt is two-thirds of the rate in the first belt. Alternatively, the whole area is considered for development by internal roads and the land rate is derived accordingly. Higher of the two land rates, thus arrived, is more appropriate since land rate depends on the best development.

Redevelopment of a property: Purchase of old buildings and its renovation before sale by a developer is not in vogue for residential properties. Such developments are made for commercial and industrial purposes. The property may be restored to its original use or built to a different type of use permissible under local bye-laws. The choice is based on the feasibility study to select the most lucrative use. Often the purchaser himself runs the business or industry after such a development of the property. For correct value of the original property, it is necessary to formulate a viable and economical proposal and estimate the returns from business or industry. Inherent in such a study is the profit method of valuation appropriate for properties meant for commercial use. If a part of the land can be separately developed for a different use, its value may be estimated by land and building method or development method and its value added to the value of the other portion appropriate for commercial or industrial use.

PRESCRIBED AND STATUTORY METHODS

Often the value of an immovable property is required to be determined for assessment according to the prescribed Act and Rules. In such a case, the value is determined strictly according to the procedure laid down. The valuation procedure relies heavily on the interpretation of the case laws and precedents. The purpose is to avoid discrimination. Most of these relate to laws for mobilisation of taxes and hence are ad hoc in nature. The objective is willing compliance and the value is often concessional.

Banks and other funding agencies prescribe procedures to determine the fair market value for grant of loan on mortgage or otherwise. The objective of such a prescription is to ensure that the amount of loan is not more than the market value of the property. Rent capitalisation method and profit method of valuation are two of the methods adopted to estimate the value of a property on a conservative level based on the conservative estimate of return from the property.

The following are some of the methods prescribed for valuation for tax purposes :

1. Rent Capitalisation Method

This method is based on the adoption of a suitable multiplier, known as the years' purchase, to the net annual rent. The latter is obtained after deducting taxes payable and the actual or admissible expenses from the gross annual income. The years' purchase is based on the level of security of investment in the real estate and is reflected in the annual income expected from investment in similar rented properties. Prescribed Rules, case laws and past precedents give some indication on the details such as *year's purchase* and limits on expenses to be considered. The Rent control Act gives occupancy rights to the tenant till the building rented out exists in a livable condition. If the life of the building is over and it is no longer safe to live in it, the owner can get the tenant evicted. In such a case of a land with very old buildings, the present worth of such reversion of land can be calculated and added to the capitalised value of rent for the anticipated future life of the building. Rates of capitalisation generally followed are indicated in Annexure 3.2. A suggested format to calculate the fair market value by rent capitalisation is at Annexure 3.3.

2. Profit Method

For some types of commercial and industrial undertakings, it is not easy to determine the market rent. In such cases, the Profit Method is adopted if the business or the industry is in operation. It is based on the Profit and Loss Account and the Balance Sheet. In view of the large assumptions involved, this method alone is not adequate for acquisition purposes. The value obtained by this method is compared with the value from Land and Building Method. The difference is examined in the light of demand and supply. If there is a boom in the particular type of business or industry as existing on the property, the value of the property is more than that obtained by the Land and Building Method. If there is a recession, the value obtained by the Profit Method is less than the one calculated by the Land and Building Method.

If there is no immediate prospect of making profit, without further substantial investment or change in business, land and building method or development method is appropriate. The component of land or land and building value is determined at the rate at which similar properties are available from public agencies to encourage industries. If it is prudent to continue with the use of existing equipment and machines, their market value may be ascertained from an expert valuer for such plant and machinery. Otherwise, salvage value is appropriate.

In the Profit Method, the value of a property is determined by capitalising the net annual profit expected from year to year. If there was no profit in the recent past, this method cannot be adopted. It is reasonable to assume that a prudent buyer may improve the business or put it to a better alternative commercial use to earn a profit. This is with a view to realise the value of the property equal to the investment. However, it may be unrealistic to assume that he will be able to realise the full potential in a quick turnaround of the business. Generally a discount of about ten percent from the value obtained by land building method is provided to put a limit on the minimum value obtained by profit method. A format for calculating the fair market value of land and building by Profit Method is at Annexure 3.4.

VALUATION REPORT

A suggested format for a valuation report outlining the requisite details for a logical step by step approach to estimate the fair market value of a property is at Annexure 4.3. Detailed discussions of the factors affecting the value of land, building or flat, data to be collected and the method of estimating the value are covered under the respective headings on valuation of land, building and flat.

SUMMARY

Principles of value lay down the rules to define how the nature of a real estate affects its value. A buyer willingly pays a very high price for a land because it is the means to his livelihood. Civic amenities are the primary factors affecting the land rate in a residential locality. Next in importance is the location of a property in the locality. The prospective buyer sees the land as a bundle of attributes. The value of the property means the value of the rights therein. The rate of return from each type of land use is different. Thus the market value of a land depends on the purpose for which it is used, the permissible and potential land use, the locality, the neighbourhood, the supply and demand and the development control regulations. Cost is not equal to the value except when there is an adequate supply. To define the demand, the class of prospective buyer and their needs are identified.

Principles of valuation are well settled rules for consistent action. Courts have defined these principles. The first step is to define the title, the rights and their owners. Enjoyment of the right to occupancy is the most valuable right (though it is not transferable). Thus it is important to find out whether the property is occupied by the owner or is tenanted. The second step is to quantify the value of the benefits from the property. The fair market value of a property is derived from comparable sale instances of similar properties in the same locality. These methods are the Comparable Sale Instance Method, Land & Building Method, Income Yield Method, Development Method and Belting Method. The spread of a locality is limited by the walking distance to the common civic amenities and the variation in land rates. Comparable Sale Instances is the best method. Land and Building method is appropriate for valuation of owner occupied properties with newly constructed buildings.

Benefits of a building accrue from its functional and aesthetic values, when the building is used. The value of a building depreciates due to use, forces of nature and obsolescence. The depreciated value depends on the ratio of the future economic life to the total economic life. Real estate developers often buy tenanted properties and develop them to the permissible extent. The development method is based on the actual method of development of land adopted in the locality.

Prescriptive and statutory methods are based on the rules specified in the appropriate Act. These rely heavily on the interpretation of the Case Laws and the precedents. The purpose is to avoid discrimination. The rent capitalisation method is based on the adoption of a suitable multiplier to the net annual rent. In the Profit Method, the net annual profit is capitalised.

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PART 2

APPLICATION

Chapter 4

Market Value of an Urban Land

Valuation of an urban land is based on appropriate analysis of sale instances. It is a skill greatly in demand. It requires a thorough knowledge of the locality, the prospective buyers, local bye-laws, history of urban development in the town and in the locality. These help to apply the appropriate principles of valuation and study the effects of the factors affecting the land rates. A logical analysis of reliable sale instances from an adequate data bank follows. How the principles are applied in practice is of great interest. To follow the logic of the prudent buyer, comparable sale instances are analysed. The prudent buyer considers several factors while determining the fair market value of an urban land. If all the variables are considered simultaneously, it is difficult to compare. It is best to consider the effects of major factors and group the minor factors into one. With less number of variables, derivation of the land rate from the sale instances is easy. Three major factors affect the land rate most — title, physical features and the market.

HOW TITLE AND ENCUMBRANCES AFFECT THE VALUE

The title and possession of a property represent its value as economic benefits. Examination of the title and the conditions in the deed of conveyance precedes the inspection of the property. A report of the title examination is the legal opinion on whether the title is clear, description of the land is definite and clear, possession of the property is undisputed and the nature of encumbrance, if any. For this purpose, the examiner of the title is required to inspect the public records also.

It is difficult to place a value on the legal encumbrances of a land. However, a rough indication may be available, considering the likely effect on the development potential and the income earning capacity. Sale instances of similarly encumbered properties gives some indications as to the land rate. Appropriate case laws on the subject of encumbrances are useful case studies on the deduction in value due to encumbrance. The most common encumbrances pertain to litigation in courts of law and the easement rights. The Indian Easements Act contains provisions relating to the right of common passage of abutting or adjoining properties; right to lay across or construct pipe lines, ducts and cables over or under land; right to light and ventilation and the right for disposal of rain water through a property.

Tenancy is a legal encumbrance. In a title deed, if tenancy is attorned, it reduces the value by an amount equal to the anticipated expenditure to get the premises vacated. The reduced value is estimated by comparison with the sale instances of similar tenanted properties. If a property is mortgaged, its value is reduced by the balance amount due from the mortgagee. The value of a property with excess vacant land but exempted by the State Government according to the Urban Land (Ceiling and Regulation) Act is limited by the conditions in the exemption certificate. If there is an encroachment, the legal position of such an encroachment needs to be examined since title itself is not adequate for enjoyment of all the rights. The reduction in value equals the anticipated expenditure to get the encroachment removed. If a legal dispute on the title is pending in a court of law, it is difficult to determine the fair market value of the property.

APPLICATION OF DEVELOPMENT CONTROL RULES TO VALUE A PROPERTY

Physical features affect the development of a property. Courts have upheld the legal validity of the bye-laws as the community's right to restrict the development of lands by private owners. However, they stipulate that the restrictions must be reasonable, equitable and applied uniformly. Often the zonal regulations are not enforced strictly. Many developments become *fait accompli* making the *de facto* application of the bye-laws and regulations different from their legal status. To determine the development potential of a property according to the Development Control Regulations, it is best to ascertain how these regulations were applied while approving the plans for the development of nearby properties.

LOCALITY

Managing the livelihood is the prime motive for the purchase of an immovable property. Livelihood means the support to maintain life. The following example highlights this aspect of the value of an urban land:

In the later part of the 1970s many slum dwellers in India were resettled in new colonies—far away from the cities. However, slum dwellers preferred to come back to the slums—though the civic services were woefully inadequate. They preferred to earn the livelihood in the city by staying in unhealthy slums than remain unemployed in healthy colonies, far away from the place of earning. Similarly, executives and businessmen prefer to pay high rents or land rates for properties in a well developed locality than stay in a suburb. The importance of a locality is highlighted by the fact that the land rate in one locality is often several times more than in another locality. The attitude toward the rights to private ownership helps to classify a locality—so also, industry and employment.

The locational advantage of some villages close together is generally the reason for their growth into a town. Later, the town grows in to a city. Locational advantage is still the basis to define the boundaries of a locality. Some localities are even now referred by the original name of the village.

Earlier, each village had its own boundary. Mostly such boundaries were physical features or hedges. Land revenue maps, some city maps and development plan maps indicate the boundaries of the erstwhile villages. These help to define the localities, since the twin criteria of common amenities and clear physical boundaries are largely met. In cities, where the village boundaries have become irrelevant, the boundaries of the jurisdiction of a police station and a postal delivery zone (with a single PIN CODE) serve as useful guides to define the boundary of a locality. Both define limited areas. The area of the latter is less. The underlying principle is that each locality is limited by the walking distance. A locality is a part of a city with its own name and whose inhabitants share the same civic amenities. It is surrounded by well defined natural or man-made features serving as boundaries.

Apart from the opportunity for business and employment in nearby localities, other factors which affect the land rate in a locality are as follows :

Proximity to appropriate civic amenities affect the land rate most: The percentages of the total area of a locality reserved for different types of land uses in a zonal planning scheme are good indicators of its development potential and the land rate in a locality. Thus a town planning scheme or a zonal plan of a locality and the information about the present phase of development help to define the boundaries of a locality. The composition and density of population in a locality determine the standard of life of the inhabitants in the locality.

Time and cost of travel to place of work affect the land rate: A recent phenomenon which has greatly affected the contribution of a locality to land values is the time and cost of travel from the place of residence to the place of work and other activities. The importance of this aspect is evident from the following :

> An executive getting a monthly salary of Rs.15,000 may have a total remuneration of Rs.30,000 per month. The earning is about Rs.2000 per working day or Rs.250 per hour. Entrepreneurs and businessmen earn more. Evidently the time for to and fro travel to a civic amenity cannot be more than half-an-hour.

Earlier, people went to the city market for competitive prices. With the realisation of money value of time, now the markets are being taken to the people in the form of neighbourhood shopping centre and the super bazar. Thus civic amenities in a developed locality should be within a distance of one kilometre. In a developing locality, the distances from some of the middle class neighbourhoods to the civic amenities of the locality may be even two kilometres. It corresponds to the limit of daily walking distance of four kilometres in one hour.

How to mark the boundaries of a locality: A locality may consist of several postal delivery zones, each with its own name and PIN CODE. To mark the boundary of a locality, one may start with the most predominant postal zone in the locality and consider adding each neighbouring zone until there is a discontinuity in the nature of development. The discontinuity is reflected by a significant variation in land rates in the neighbouring zones. Railway tracks, major highways, large water bodies, district parks and sudden changes in the topography constitute the discontinuity to development. These often outline the boundaries between localities.

NEIGHBOURHOOD

To cater to the needs of different income groups of the society and for different needs, each residential locality has several neighbourhoods. Town planners recognise this well-known principle. Thus neighbourhoods are planned for residents as : very important people, high income group, middle income group and the low income group. *A neighbourhood is the smallest single area in the locality with similar housing and population characteristics such as the level of income, business or profession; religion; ethnic origin and the lifestyle.* High achievers acquire the symbols of success such as an elegant home in a decent neighbourhood. Inhabitants of a single residential neighbourhood share the same civic amenities for their daily routine requirements. These include the neighbourhood shopping, bus stop, park, playground, primary school and the service centre. Ideally no part of the neighbourhood should be away from such civic amenities, by a distance more than one kilometre, to limit the distance to be walked daily.

Each neighbourhood has a predominant land use, a distinct class of neighbours and a specific name or a number for the block or the area. Civic amenities are more inside the area covered by the municipality than in outlying areas. These are closely located in fully developed localities with high land rates near the civic centres. Here, the area of each neighbourhood may even be less than one square kilometre. In the peripheral areas near the boundary of the civic corporation, it may be as large as four square kilometres. The limit is based on the walking distance to the civic amenities being limited to two kilometres. In the outlying areas, the level of development is an important factor for classification of the neighbourhood.

The map of a town planning scheme or the zonal plan indicates the relative sizes of the plots of land and the widths of the roads. Thus it is possible to determine the type of development permissible in a neighbourhood. The additional information about the type of layout, the phase of development and the class of people in a neighbourhood, based on the level of their income, helps to classify the neighbourhood.

Generally tenants cannot afford to pay rents more than 25 to 30 per cent of the gross income. The gross annual rental value capitalised in perpetuity is an indication of the class of the neighbourhood.

The working class can afford only the basic shelter. High achievers in business are ready to pay a higher price for a property in a decent locality because it has a high present value to them. The priorities for different types of civic amenities vary according to the class of the neighbourhood. High income groups greatly value privacy and prefer quiet neighbourhoods.

How to Mark the Boundaries of Different Classes of Neighbourhoods

The nature of permissible land use is the most important aspect to classify the neighbourhoods as commercial, residential, institutional or industrial. Further division as high, middle and low income group is based on the class of prospective buyers. It depends on the fair market value of a property representative of the class of the neighbourhood. A neighbourhood may have plots of land of different sizes. A variation of about twenty-five per cent from the average size of a plot in a neighbourhood may not mean a change in the class. A variation of fifty per cent or more may mean that the block of plots belongs to a different class. However, the land rate may be the same since they share the same neighbourhood and its infrastructure.

The boundary of a particular class of neighbourhood can be marked on the development plan of the locality as it shows the information regarding the sizes of the plots, widths of the roads and the permissible land uses. Reference may be made to the area of the postal delivery zone with its own PIN CODE. The Survey of India map of the city may be referred for information on the topography and the existing development. The latter information may also be available from the zonal plans or the town planning schemes.

The actual spread of each class of neighbourhood is observed from the inspection of the locality. It is marked along the roads. A separate colour may be used to indicate each class distinctly. A nearby slum or a village is a disadvantage. Existence of a slum may affect the classification of the adjacent neighbourhood. The locations and the boundaries of the villages and the slums are marked before classifying the neighbourhoods and marking their boundaries.

The land rate in an area adjacent to a neighbourhood may be appreciably higher or lower by an amount (say by twenty per cent) more than the extent of variation in land rates in the neighbourhood. In such a case, the adjacent area is included in a different neighbourhood. Otherwise the area is included in the same neighbourhood. The difference between the average land rates in adjacent neighbourhoods may, in some cases, be appreciably higher or lower by an amount (say by fifty per cent) more than the extent of variation in the land rates in a neighbourhood. In such a case, it is appropriate to place the adjacent neighbourhoods in different localities.

The existence of a slum in a neighbourhood greatly affects the entire neighbourhood. However, the existence of a village or a low income group neighbourhood merely affects the row of properties adjacent to the boundary.

In the developing stage of a locality, the neighbourhood which contains the shopping complex and the civic institutions is more valuable. Hence, it is sought and patronised by the high income group.

Classification is Confirmed from Sale Instances

The classification of neighbourhoods done on the basis of the maps, development plans and detailed inspection of the locality is verified by marking the locations of the properties in the sale instances. The classification of a property and its neighbourhood depend on the nature of the property, the neighbouring properties and the properties along the roads in the immediate neighbourhood (as shown in Annexure 4.1.).

Classification of the immediate neighbourhood of a property is based on the existing properties. Ascertaining the predominant buying motives of the prospective buyer group is essential to assess the demand. The properties available for satisfaction of the demand for properties in the neighbourhood helps to assess the supply. A study of both helps to classify the neighbourhood based on the present demand. It is facilitated by obtaining information about the age, business and ethnic profiles of the prospective buyers. Of particular interest is the site data collected for each sale instance according to the proforma shown in Annexure 4.1.

Mere inclusion of an area in the Zonal Plan in a certain planning zone with high income group or the proposed development plans for the locality does not guarantee that a high land rate could be sustained. It is the actual use of land and the amount of investment in the neighbourhood that determines the sustainable land value. Quite often, the actual development in a locality or a neighbourhood evolves in a manner much different from what the planners foresaw. When this happens on a large-scale, it is time to expect a revision of the City Development Plan. Ground realities including the trend of development are considered while preparing the valuation maps indicating the valuation districts and the high, middle and low income group neighbourhoods. Even a few purchases made at higher rates may change the class of neighbourhood. Often this is initiated by the announcement of an imminent major development in the locality. It may also be due to a sustained demand from a particular class of prospective buyers. The class of a neighbourhood is dynamic in character and changes with time, particularly during the rapid growth of real estate business. The land rates in adjacent neighbourhoods tend to even out as the land rates rise rapidly in a locality. Such a phenomenon was observed in the following actual instances:

> There was a rapid growth of business in a city due to several businessmen shifting a substantial part of their business from another city. To avail this opportunity, a few non-resident Indians (NRIs) bought some properties at much higher rates in a neighbourhood. It suddenly pushed up the land rates and the continued demand changed the classification of the neighbourhood to a high income group. The rapid growth in real estate purchases were preceded by the announcement of the proposal for major developments such as a commercial shopping centre in the locality. This was eventually reflected in the revised development plan of the city. A similar phenomenon was noticed in another locality with residents from several parts of India. The locality was preferred by the businessmen from other parts of India. As the businessmen continued to buy lands in the locality at high rates, the differences in rates between adjacent neighbourhoods in the locality was greatly reduced and in some cases eliminated.

Demand Decides the Best Use of Lands.

The real estate market is sensitive to changes in employment opportunities, wage levels, income stability, availability of home finance and the state of the money market. Urban growth entails a slow but continuous change in land use. The land use in inner areas of the city becomes more intensive and the city expands outward too. These areas constitute the major market for land. Current market rates are the result of interaction of supply and demand. These are reliable to derive the land rates.

In the initial stages of development of a locality, the market value of land depends on its location with respect to civic amenities and characteristics such as orientation, size and shape. With progress of development in the locality, economic values of lands go on increasing. As the number of vacant lands decreases, choices become limited and the land value is more dependent on its location and the permissible floor area ratio than such physical factors as orientation, size and shape.

Sale Instances are the Result of Supply and Demand

In view of the high investment involved, a prospective buyer makes a detailed investigation. Consequently he makes a wise decision with regard to fulfillment of the purpose for which he buys the land. Livelihood, prestige, comfort (from civic amenities) and profit are the predominant buying motives. Land rate depends directly on the number of properties available for sale and indirectly on the number of vacant properties in the neighbouhood. The data, when compiled for several transactions in a locality, yield useful information on the social and the economic trend. Real estate brokers meticulously maintain details of enquiries for purchase and sale of land. Response to newspaper advertisements and auctions are other sources of useful information. In general, the price fetched in a private sale is different from that in an auction. In the former case, the seller waits till the right customer arrives to realise the best use of the property. Similar is the advantage for the purchaser. It is easy to discern the factors which affect the land rates at different stages in urban development, if we follow the growth of urban development in the city. It helps to identify the comparable sale instances.

HOW TO IDENTIFY A COMPARABLE SALE INSTANCE

To be comparable, properties must be similar. A fully built-up property cannot be compared with a nearly vacant land. A prudent buyer focussess his attention on the predominant component of the value of a property with land and building. The following criteria help to group the sale instances for comparison :

a. When Land Value is Predominant

In actual disposition, no two lands are exactly alike. We have to determine the limit beyond which two properties cease to be comparable. Courts seem to rely heavily on the locality being the same for the purpose of comparison. We have to visualise the prospective buyer, his buying motives and whether he will accept the properties to be in the same locality and comparable. Neighbourhood, physical features, site particulars and the market affect the potential for development of a land and hence its value. In order that such a visualisation is not subjective or imaginary, a careful analysis of past sale instance is necessary. Comparable land rates is the best guide.

The land rate for one type of land use cannot be derived from sale instances of a different type. Even in the same type, as far as possible, land rate should be derived from sale instances of the same income group neighbourhood. Further, physical location in the neighbourhood by itself is not adequate for two properties to be comparable. The type of development permissible as per local bye-laws and regulations should be similar. If a single dwelling is permissible on a land owing to its size or other restrictions, its land rate cannot be derived from the sale instances of lands where construction of apartments or a group housing complex is permissible.

Land rate for a property in the second belt, such as on a back lane in a commercial locality, cannot be derived from the sale instances of lands in the first belt by the side of the main road.

In the initial stages of development of a town or a city, high, middle and low income group neighbourhoods can clearly be demarcated (as in New Delhi). As the city grows older and the pressure of the population to crowd in certain localities for livelihood or business increases, it may no longer be possible to make a firm distinction, since high, middle and low income groups coexist side by side (as in old Delhi). In such a situation, the land rate for the class (high/middle/low income group) can be derived from the other. However, the derivation from one type, that is commercial, institutional or residential to the other type is not permitted.

The depreciation of properties in an old neighbourhood is reflected in the lower rents as compared to rents of properties in newer neighbourhoods. The depreciation of an old neighbourhood lowers its class. Comparison of land rates in such neighbourhoods is based on capitalisation of current levels of rents. The rate of capitalisation equals the ratio of the sale value of similar, but tenanted properties to the corresponding actual rents.

While a mere speculative value cannot be upheld, instances that others have recently changed the land use is an adequate ground to consider upgradation of the land from one type to another. (In the past many residential areas in the Park Street locality in Calcutta changed into commercial). While the effect of neighbourhood is considerable on the value of a property, the effect is reduced in the case of a land suitable for a multistory building or a group housing compex. The class of prospective purchasers of accommodation in such a scheme determines who the neighbours are. By providing amenities not available in the neighbourhood, it has the capacity to create its own micro-environment. Combined with the substantially higher permissible floor area ratio, such lands belong to a class by itself. However, nearby slums greatly affect the market values of flats and hence the classification of the land itself.

For a commercial property, the income yielding capacity is the only reliable index to its fair market value. The value is highly sensitive to location, frontage and the corner effects. Thus the land rate derived from comparable sale instances is compared with the value obtained from the Yield Method, based on the market rent.

For proper comparison, properties in a commercial locality should be in close vicinity. Even then the land rates may vary considerably, owing to the substantial difference in their return earning capabilities. The shop has to reach the customer and not vice versa. In the initial stage, the spread of commercial development in the locality is uneven. When the development in a locality becomes saturated, the difference in land rates due to location becomes minimal. A large size of the commercial land does not call for reduction in land rate. On the other hand it is more suitable for a commercial complex. As the first belt of commercial land adjacent to the main road in a locality gets saturated with development, the land in the interior (behind the first belt) gets opened up for further development.

b. When the Building Value is Predominant

When a building value is predominant, the prospective buyer evaluates the functional worth of the building. The value of a built-up property is derived from the sale instances of similar properties by comparing their functional worths. Classification of buildings is done according to the requirements of the prospective buyer groups (V.I.P, H.I.G, M.I.G and L.I.G).

c. When Land and Building Values are Substantial

In this case, components of the land and building values are separately compared. In a developing neighbourhood, the ratio of the costs of new buildings to the respective land values is a good basis to derive the fair market value of a land of similar size.

Database of Sale Instances

A computerised database of reliable sale instances is of immense help for query based analysis to facilitate classification of a locality into different classes of neighbourhoods and determine the extent to which each of the physical factors affects the land rate. A suggested format is shown in Table 4.1.

Comparison is in the Same Phase of the Market

Real estate booms and depressions have a longer business cycle with higher peaks and lows than in general business. However, such phases generally follow in synchronisation with the corresponding booms and depressions of the general business. If there is a persistent recession in the general business, it later affects the real estate business. Short-term business changes do not affect real estate values. Thus sale instances in the same phase of the real estate business cycle alone can be compared.

Table 4.1

Suggested Format For Preparing Computersied Data Base of Sale Instances of Lands and Buildings in a City

Locality :
Address :
Location : Intermediate/Corner
Permissible land use :
Class of neighbourhood :
Permissible F.A.R./F.S.I. :
Area of Land :
Road width :
Frontage :
Plinth area of building :
Future economic life :
Type of building :
Reproduction cost of building :
Agreement date :
Consideration : Rs. :
Actual use (if different from permissible use) :
Special advantages affecting value :
Disadvantages adversely affecting value :
Encumbrance :
Current rentals for fully developed properties of comparable size:
Buying motive :
Selling motive :
Percentage of vacant plots in the neighbourhood :
Number of (comparable) properties available for sale:

In the long-run, the demand for land equals the supply. In such a stable market, the rate of increase in land rate with time tends to remain constant. Such a condition prevails in normal times when most of the purchases are made for own use. Often properties are purchased for business or its related use. The demand for land is then more dynamic than its supply.

A sudden influx of population, increase in income or spurt in business activities increases the demand considerably. It happens within a few weeks or months, thus increasing the land prices rapidly. Vacant properties available for sale are limited. These are the first ones to be sold at higher rates. If the demand still persists, buyers offer much higher prices to induce the land owners to sell their properties and look for alternative accommodation. Investors in the real estate business buy land in the early stage of the upward trend in the land rate. The higher rate of increase is sustained as long as the improved business environment and the demand persists. In the later part of the boom in the real estate business, prices remain steady in this new state. If there has been a spurt in land prices recently, no meaningful forecast can be made on the basis of the past sale instances. Often the steep rise in land rate relates to the demand for lands in a particular neighbourhood. It is best to rely on recent sale instances in the neighbourhood only. The phase is easily identified by a steep increase in the land rates and the number of purchases by business and real estate investors.

To determine the annual increase in land rates, the average land rate for each year is determined. Some plots of land may have less frontage than the average, while others may have more. Formulae exist for correction of the land rates on account of physical factors such as frontage-to-depth ratio. If a large number of sale instances are considered, the average land rate is not significantly affected due to such corrections because of their compensating nature. Otherwise suitable corrections are made for greater accuracy. Graphs are plotted (with or without correction for physical factors) to show the rise in land rates *vis-a-vis* time for each class of neighbourhood in a locality.In normal times the rate of rise is the same for each class, over a particular period. The overall increase in land rate bears a certain relationship to the long-range inflation rate (as seen from the interest rate of long-term securities). Thus adoption of an average rate of increase per annum is in order; but not when there is a rapid increase in the land rate. A change in the rate of rise is indicative of a change in the phase of real estate business due to sociological factors or shift in commercial activities from or to a particular area. The phase of rapid rise is due to brisk business activity and is limited to a particular locality, a town or a city. For the graph to be reliable, adequate number of sale instances are necessary.

HOW PHYSICAL FEATURES AFFECT THE LAND RATE

The width and the length of a plot of land and the width of access road are the prime physical features. They affect the permissible floor area for development of the land. They greatly affect the land rate. The maximum variation in land rate is limited by the variation in the permissible floor area ratio. Even in cities where the permissible development is limited, F.A.R varies from 1.00 to 1.50. With the average at 1.25, the variation is about plus or minus twenty per cent. The corresponding variation in the land rate is less because a higher permissible floor area is not equivalent to having more area of land itself. The maximum variation in land rates is upto plus or minus fifteen per cent depending on the city and the locality.

Effect of Width of Road and Permissible Floor Area Ratio

In the primary stage of development, access road is the most important civic amenity. It continues to be important at all stages of development. Often full development of land according to the permissible floor area ratio is the practice. Here, the land rate is primarily dependent on the permissible floor area ratio and the ratio actually utilised. The permissible floor area ratio depends on the width of public access road and the size of the plot. Thus the percentage of variation in land rate partly includes the effect of the access road width.

Very big size plots in localities with adequate infrastructure facilities have higher permissible floor area ratios due to their suitability for group housing or multi-storeyed flats. In such cases, the land rate is very high as compared to other plots suitable for one or two dwellings. Thus the land rate of the former category cannot be derived from the latter. In the absence of actual sale instances for such big size plots, the land rate stipulated in the reliable agreements for sale of flats in the locality is a good guide.

Some smaller citites and municipalities still permit development of land on other considerations such as the minimum width of land to be kept vacant on the sides, in front and rear. In such towns, the land rate depends more on the frontage and the length of a plot (apart from width of access road) than on the floor area ratio.

Bigger size plots of land belong to the high income group. Generally these are located on wider roads. Thus a part of the effect due to the width of the road and the size of the plot is already considered in the land rate for the class of neighbourhood. The other part is due to the effect on permissible development according to the local bye-laws. Beyond these two aspects, the effect due to the width of access road alone is limited. This effect may be assessed from the analysis of past sale instances. The coefficients of land rates, taking into account the effect of width of road, have been evolved by the author on the basis of the following principles and assumptions:

1. The coefficients in the table are used to derive land rate from sale instances in the same class of neighbourhood only. They indicate the net effect after taking into account the effect of wider roads on the class of neighbourhood.

2. There is a standard width of public road for a particular class of neighbourhood in a locality. A wider road means better amenities and hence higher land rate for properties along the road. However, in some very important neighbourhoods, people prefer quiet areas in the neighbourhood than by the wider road. Thepurpose is to avoid the traffic and the associated noise and other disturbances.

3. A three or four-and-a-half metre wide road is barely sufficient for a one way motorised traffic. A six metre wide road is for single lane traffic with the provision for side drains or footpaths with underground drains. A nine metre wide road is with side drains and footpaths. A twelve metre wide road is suitable for two lanes. An eighteen metre wide road is suitable for wide footpaths, generally provided for shops along the road. A twenty-four metre wide road is suitable for four lane traffic.

Width of Frontage and Length of a Plot

Both the frontage and the length of a plot affect the land rate. The effect of frontage is greater. Since both are inter-related their effects could be combined. However, it is easy to understand the effect of each separately.

Effect of frontage

In the early stages of development of a town, plots of land on the road side fetch a higher land rate than unplotted developments. Access by road is the only civic amenity available. The value of a land is predominantly governed by its frontage and is sold as units of frontage. In urban localities, land rate is for unit area. Yet, the value of a land is affected by its frontage because a larger width of frontage permits better development of the land. Generally the most common size of plots of land for a particular class of neighbourhood has a standard width and a standard length. Based on the analysis of actual sale instances in several large cities, the author has evolved coefficients for variation in land rates. The coefficients are for properties with actual front widths different from the standard. These coefficients have been evolved on the basis of the following principles:

1. The most common size plots of land in a particular class of neighbourhood in a locality have nearly the same front width and the length (perpendicular to the road). The proportion of the standard width of frontage to the standard length generally varies from 2:3 to 3:4.

2. It is observed that almost all the plots have the width to length ratio lying between 1:2 to 2:1. Most of the plots have the width lying between three-fourths and one-and-one-fourth, of the standard width.

3. The discount in land rate for a plot of land with actual width less than the standard is more than the premium for an equal increase in front width.

Effect of length of a plot

A length (perpendicular to the road) larger than the standard reduces the land rate per unit area because the additional land at the rear cannot be utilised as effectively. A few empirical formulae exist to calculate the effect of distances of strips of land from the access road. These depend on the importance to be given to the access and the road.

According to Hoffman's Rule, the front half of a standard length property is worth two-thirds of the whole cost and the rear half, the balance one-third. This is more appropriate for lands with commercial use. A similar Rule is 4:3:2:1. It may be adopted for lands with residential use if actual sale instances justify it. These rules are applied for valuation of plots of lesser depths (lengths) than the standard. According to Davie's rule applied to any depth of plot, the multiplication factor 'gamma' for value, as compared to value of plots with standard depth, is given by: n = Square root of 1.45 * (Ratio of depth of a plot to standard depth + 0.352-0.226). According to Somer's Rule, a curve is plotted of cumulative values as the lengths of plots increase. The steepness of the curve depends on the importance of the public access road and the land use—residential or commercial. Co-efficients were obtained from these graphs for plots of different lengths. The coefficient for the standard length of 30 metres was considered as 1.00. These rules are also based on the principle that strips of land away from the access road have less values than those near the road. The influence of frontage is greatest for retail commercial properties. It is least for residential properties in fully developed high income group neighbourhoods in a large city.

The best approach is to apply the rule that seems most appropriate for a particular city. The results were considered for acceptability from the analysis of sale instances of properties in large cities. The author has come to the conclusion that the coefficients according to Somer's Square Foot Rule are too high to be applied for derivation of land rate. Perhaps these coefficients can be applied for properties in small cities and towns where the frontage is more valued; but the land is sold by units of area (instead of by units of front width along with public access road). Thus a separate set of coefficients has been evolved by the author as shown for residential properties in large cities. These are based on actual sale instances. Apart from the fact that strips of land away from the road have less value, the coefficients have been worked out, based on the following principles:

1. Each class of neighbourhood has a standard length of the plot which is for the most common size. The minimum actual length of any land measured from the access road is twelve metres.

2. For a neighbourhood with standard length (perpendicular to the road) of plots of eighteen metres or more, there is no advantage if the actual length is less than eighteen metres. The planning of a building is adversely affected if the total length of the plot is less than eighteen metres. The advantage of the area being nearer to the road is offset by the adverse effect on the plan of the building.

3. If the width of a plot for residential use is the same as in the neighbourhood, but the length (perpendicular to the road) is less than the standard, there is no significant effect on the land rate. The advantage of more area being near the road is neutralised by the disadvantage due to less area of the plot. The latter is due to the requirement of setbacks of the building lines.

4. For lands with roads abutting on two adjacent sides, the land rate may be higher by about ten per cent. The extent depends on the class of neighbourhood and the importance of the roads on land rate. Corner plots are considered as plots with return frontage. The preceding formulae for the actual width of plot versus the standard width equally apply to such corner plots. The total width of frontage along both the roads is considered for this purpose.

Combined effect of Frontage and Length

The combined effect is obtained by multiplying the two coefficients corresponding to the actual frontage and length.

Examples are shown below to illustrate this.

Example- 1

Let the standard frontage and length of a plot in a neighbourhood be 18 metres and 27 metres respectively.

Problem :

To calculate the coefficient for a plot of size 12 metres frontage and 18 metres length.

Answer :

Coefficient for actual depth of 18 metres against the standard depth of 27 metres (based on the appropriate formula or table developed from experience) = 1.065.

Coefficient for actual width of twelve metres against the standard width of 18 metres = 0.955.

Therefore, appropriate coefficient is 1.065 * 0.955 = 1.017

Note : It indicates that the land rate due to the smaller size of the plot is more by two per cent only. The increase in land rate is small if the ratio of width to length remains unaltered.

Example- 2

Problem:

To calculate the coefficient for a plot of width 15 metres and length 36 metres in the neighbourhood cited in Example-1

Answer:

Coefficient for width of frontage = 0.980
Coefficient for length = 0.935
Appropriate coefficient = 0.980 * 0.935 = 0.9163

Note : It indicates that there is an appreciable reduction in land rate when the depth of a plot is more but there is no corresponding increase in the width. The land rate is decreased since the land at the rear cannot be effectively used for building. The extent depends on the effect and the importance of the access road, on the land rate.

Example- 3

Problem :

To calculate the coefficient for a plot with a frontage of 27 metres and length 18 metres in the neighbourhood cited in Example - 1

Answer :

Coefficient for width of frontage = 1.030
Coefficient for length = 1.065
Appropriate coefficient = 1.030 * 1.065 = 1.097 (say, ten percent.)

Note : It indicates that the land rate is appreciably increased for a plot of land with more frontage and less depth. The land rate is increased since the land area at the rear is reduced and replaced by the area adjacent to the road with more frontage. It gives the advantage of better planning and better front elevation. The extent depends on the effect of the importance of access road on the value of the land.

Irregular Shape of Land

Generally an irregular shape of a land is not a disadvantage if it contributes to a greater width of frontage than for a rectangular plot. Otherwise, the best possible layout for development, consistent with bye-laws is considered. Based on this layout, the effective floor area ratio and the corresponding land rate is derived.

Thus the irregular shape a of plot is a significant disadvantage for a small size plot only.

Topography

The terrain is important—except for multistory buildings and for high income groups who prefer the view and privacy more than the additional expenditure involved. The influence of topography and 'view' on the land rate is largely restricted to residential properties. In any locality, lands at higher elevations fetch better land rates. In an area with plateaus, slopes and valleys, lands at higher elevations fetch better rates. If there is a scarcity of water supply, the rate is discounted. A low lying and occasionally water logged plot or one with large pits, requires filling and an extra depth of foundation. It is expensive in the case of load bearing construction.

HOW AMENITIES AND MICRO-ENVIRONMENT AFFECT THE LAND RATE

Public services available near the site affect the cost of development of the site. In metropolitan cities, the value of the building component is 30 to 50 per cent of the total value of the property. Site development costs about ten per cent of the cost of a dwelling. Thus the total value of site development may be considered as five per cent of the value of the land. The effect of variation of site particulars on the land rate is less than half of five per cent.

The micro-environment includes the effect due to the neighbours, the neighbouring properties and the micro-climate. In metropolitan cities, the combined effect of these on the land rate is about five per cent. In smaller cities, the value of a building is more than the value of the land. Thus the percentage of variation in land rate is higher. The following are the factors affecting the micro-environment and the micro-climate:

1. The neighbours
2. The neighbouring properties, their values, layouts and elevations.
3. Landscape of the adjacent lands
4. Orientation of the plot
5. Site particulars

ANALYSIS OF SALE INSTANCES

The sale instances of immovable properties in a city are sorted locality-wise. When the land rates from sale instances are normalised by corrections for physical factors and time, distinct groups of land rates emerge. These correspond to the classes of neighbourhoods. The earlier classification of land in each sale instance as V.I.P., H.I.G., M.I.G. or L.I.G., done on the basis of field data, is compared with the classification based on distinct groups of the land rates. Any discrepancy is reviewed.

After normalising for the effects of physical features, the land rates of sale instances of each class of neighbouhood in a locality are plotted on a graph. The line of average land rates is drawn for each class. Sale instances with exceptionally high or low rates, with deviations more than twice the standard deviation, are excluded. The graphs indicate the variation of land rates with time. Alternatively, the physical factors of lands are measured and their influence on land rates determined mathematically from the correlation and regression analyses.

It is an observed phenomenon that the inflation in land rates is generally higher than the rate of inflation reflected in the wholesale price index. Reasons need to be ascertained if the observed rate of inflation in the land rate is less than the annual inflation of the wholesale price index.

LAND RATE DERIVED FROM THE VALUE OF LAND AND BUILDING

Availability of completely vacant lands in a developed locality is rare. An existing building contributes to the value of the property if it is not an obstacle to proper realisation of the land value through appropriate development of adjacent vacant land. In such a case, the value of land appurtent to the buildings is calculated at the land rate as applicable for lands with buildings. It is combined with the replacement cost of the building, minus the depreciation accrued due to use and obsolescence. The land rate for the excess vacant land is higher. It allows additional ground area to be covered by new construction. The value based on this cost approach is compared with the value derived from actual sale instances of land and building (market approach). Sometimes it is economical to dismantle the existing building. It releases the land for development according to present day norms, specifications and higher floor area ratio permissible. In such a case, the whole land is valued at the rate of vacant land plus salvage value of the building. Thus the land value of such an encumbered land with a dismantlable building is the higher of the value obtained by Land and Building Method and as vacant land plus salvage value of the building. For such a proper comparison of land rates, the value of the building should be a small part, say fifteen per cent of the total value or even less.

MARKET VALUE OF A LEASEHOLD LAND

In the initial stages of urban development in a town or city, both freehold and leasehold lands are available. For a leasehold land the land value is apportioned between the lessor and the lessee. Further, a deduction of about ten per cent seems necessary to account for the joint ownership and the general conditions imposed by the lease. If there are restrictive clauses as to the use or development, the land rate is further reduced. With the saturation of development in a locality, the landlord imposes such restrictions together with the right of reversion of land after the lease period.

INSPECTION AND SURVEY

The main purpose of inspection is to identify the property and compare what is at site with those stated in the documents. The description of urban land in the schedule of agreement is usually by metes (measures) and bounds (directions). In case of discrepancy, the reason is noted. The purpose of the survey is to verify the boundaries as stated in the site plan attached to the deed of conveyance and establish the land area by measurement. One important aspect of inspection of the locality is to assess the class of neighbourhood.For this purpose, the details are collected according to the proforma shown in Annexure 4.1. Details of the description of land for the effect of development potential are collected as per Annexure 4.2. and data required for devlopment of land according to the proforma shown in Annexure 2.1.

The fair market value is derived from the sale instances as indicated in Annexure 4.3.

MARKET VALUE OF A TENANTED PROPERTY

Most of the rent control acts do not prohibit the redevelopment of the land provided the tenant is accommodated suitably in the new development. Quite often, a negotiation is held with the tenant. Where a minor portion of the land with the building is tenanted, the gross value of the entire land is calculated. A deduction is made for the loss of floor area due to accommodation for the tenant. To this, the rental value is added. If such a redevelopment is untenable according to the Rent Control Act, the only alternative is to value the rented building with appurtenant land separately. After allocation of the appurtenant land, if no new development is possible in the excess land, the whole of the premises is valued by Rental Method. Suitable allowances is made for the rental value of the excess land.

The market value of a partly or wholly tenanted property is based on comparable sale instances of similar tenanted properties. Such properties are bought for further development. The tenant is compensated for vacating the premises. Alternatively, he is accommodated in the new development. The procedure to calculate the fair market value of such properties is indicated in Chapter 10. Sometimes people buy such properties for their own use. Either the tenant is compensated for vacating the premises or additional construction is made to accommodate the new owner.

STEPS TO NAME THE LOCALITIES AND MARK THEIR BOUNDARIES

Following are the steps to name the localities in a city:

1. The map of the city, the list of all the localities in the city and the list of postal delivery zones (each with its own PINCODE) are referred.
2. The master plan or development plan of the city is referred to study the existing development and physical features. The names of major localities and shopping centres are listed.
3. Existing commercial, institutional and industrial localities are identified by inspecting the localities and verification from the zonal development plans and town planning schemes.

Following are the steps to define the boundaries of the localities in a city:

1. The boundary of the corporation or municipal limit is markedon the city map.
2. On the zonal map showing the existing and the proposed land uses, the major roads or other physical features defining the boundaries of commercial, public and industrial localities are marked.
3. Boundaries of existing commercial, instituional and industrial localaties are identified by inspecting the localities and varification from the zonal devlopment plans and town planning schemes.

STEPS TO CLASSIFY THE NEIGHBOURHOODS AND MARK THEIR BOUNDARIES

The following arethe steps to classify the neighbourhoods in alocality as V.I.P, H.I.G., M.I.G. and L.I.G. and mark their boundaries:

1. The town planning scheme is studied and the locality is inspected. Important characteristics affecting the land rates in the neighbourhood are listed.
2. The maps showing slums and villages or gramthanas are superimposed on the map of the locality showing the land uses.

3. The civic amenities are prioritised according to the requirements of each class (V.I.P, H.I.G., M.I.G. and L.I.G.) of prospective buyers.

4. For each neighbourhood, the location of civic amenities needed daily are marked.

5. The class of neighbours and the type and phase of development of the layout, with a distinct name for the block or the area, help to define the extent of spread of a neighbourhood.

6. The location of properties referred in the saleinstances are marked on the zonal plan indicating the land use and the zones based on development control regulations. The land rates from the sale instances are analysed after normalising them for the effect of time and the physical features. The classification of neighbourhood (according to the proforma shown in Annexure 4.1.) for each sale instance is compared with the information from steps 1 to 5.

7. Business neighbourhoods are classified according to the classes of business and the boundaries are defined accordingly.

8. The plot sizes in different classes of neighbourhoods are different. The spread of a neighbourhood depends on the class of prospective buyers which in turn, depends on the land values. The spread of each neighbourhood is limited by the distance to the civic amenities in the neighbourhood for daily necessities.

STEPS TO DETERMINE FAIR MARKET VALUE OF A LAND

1. A member of legal profession verifies the title of the land and the up-to-date encumbrance certificate is obtained from the sub-Registrar.

2. The description of the property, occupancy and development aspects are verified at the site and from the records. The bundle of ownership rights is defined.

3. Information about the neighbourhood (according to the form in Annexure 4.1.) and the site (according to the form in Annexure 4.2. and Annexure 2.1.) are collected from the inspection of the site and its neighbourhood.

4. The neighbourhood is classified (following the steps listed earlier in this chapter)

5. *The fair market value is derived from comparable sale instances. It is essential that at least three sale instances are available.*

SUMMARY

Three major factors affect the landrate — title, physical features and the market. Title and public records are examined by a member of the legal profession to determine the bundle of rights and encumbrances, if any. Physical features affect the development of a property according to Development Control Regulations. Managing the livelihood is the prime motive for the purchase of an immovable property. Locality greatly affects the opportunity for business and employment and hence the land rate. The percentages of the total area of a locality reserved for different types of land uses affect the land rate. Each locality has several neighbourhoods classified as V.I.P, H.I.G, M.I.G and L.I.G. People of a neighbourhood share the same civic amenities for their daily necessities. Land rates in the same class of neighbourhood are comparable. Land rate depends on the member of properties available for sale and indirectly on the number of vacant properties in the neighbourhood. For a commercial property, fair market value depends on its income yielding capacity. Sale instances in the same phase of the real estate business cycle alone are comparable. The width and length of a plot of land and the width of access road affect the development and hence the land rate. The author has developed Tables of coefficients for variation in land rates for plots different from standard size and standard width of road in a neighbourhood. The irregular shape of a plot is a disadvantage in terms for the frontage only. In a locality, lands at higher levels have better market values. Public services available near the site affect the cost of development and hance the land rate. The micro-environment including the effects of neighbours and the micro- climate affects the condition of living and hence the land rate. Sale instances of immovable properties in a city are sorted locality wise and are analysed step by step.

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Chapter 5

Market Value of a Building

Investment in a building is motivated by the desire to live in it now or in future. The built-up environment conforms to the owner's requirement. Such a requirement does not necessarily conform to the demand in the market. Thus it has a limited market when compared to the market for a vacant land. Needs of the prospective buyer greatly influence the market value. He may feel greatly satisfied and proud to own a beautifully constructed building. In another case, he may make a compromise to live with it, after making additions and alterations. In the former case, he may offer a price marginally higher than the one obtained by the cost approach, that is, by the Land and Building Method. This may be due to the prestige of the building. In the other case, when he has to make a compromise, he has to evaluate each of the three possible courses of action — demolish the building, make additions and alterations or live with some dissatisfaction. The land is thus encumbered with the building. He may offer a lower price than the sum of the value of vacant land and reproduction cost of the building.

In the theoretical approach, depreciation of a building is assumed to be uniform. It is depicted as a straight line formula. In reality however, it is not so. The aesthetic value of the building finishes, the comfort value of services and the value of the structure have different rates of depreciation.

A new building requires little maintenance. Thus the net earning capacity of a building or a flat is much higher in the initial years of its use, than later. The difference is more than the one accounted by a the straight line depreciation method. In the latter method, the yearly depreciation is uniform over the entire economic life of the building.

The reproduction cost approach is insensitive to rapid changes in the demand for newer materials coming to the market. Such materials replace older types. They have lower cost and better value, while performing the same functions. A building must serve the full purpose for which it was designed. Depreciated cost method does not take into consideration these aspects and is thus inappropriate.

The value of a building can bederived from actual sale instances of similar buildings bycomparing their functional worths. In value engineering concepts, functional worth is the lowest possible cost at which the performance requirements can be met. This is precisely the objective of the prudent buyer. Thus we need to compare the cost approach of the land and building method with the market approach to determine the value of a built-up property.

VALUE APPROACH TO DETERMINE MARKET VALUE

Valuation of a building must start with the appraisal of how well it serves the purpose for which it was designed. It is presumed that a prospective buyer can be found whose requirements are similar to those for which the building was designed. The next step is to define the performance specifications based on the needs of the prospective buyer. Market value of a building is derived from comparable sale instances of similar properties with the same class of buildings in the locality. Suitable adjustments are made for the differences in the functional worths of the building specifications and characteristics of the lands.

The promoter's profit is relevant for valuation of flats but not for isolated buildings. The latter are generally got constructed by the owners themselves through a contract or under the owner's supervision.

Actual cost is not the same as value. The cost of reproduction on the date of completion is more than the actual cost incurred. The difference is on account of increase in the cost index.

Analysing Building Characteristics for Value

A prudent buyer looks for those characteristics in a building which will benefit him. Characteristics are built into the building as a part of the design process by the architect to suit the requirements of the owner. The design of a building is based on economics. Evaluation by the owner after its completion is based on the answer to the question, "What will it do for me?" Thus analysis of functions, being the foundation of performance evaluation, is also the basis for value analysis

Value Aspects in the Design of a Building

The actual performance of a building is judged by comparison with those of a similar class of buildings. Design criteria are worked out from performance requirements. The extent to which each of these criteria affects the value of a building and the manner of its evaluation are discussed in the following paragraphs.

Architecture is the design of buildings for beauty and performance of the functions. Thus the client and the architect control the aesthetic and functional worth of a building. The client's evaluation is based on his subjective assessment. It is often found wanting when measured against the criteria for evaluation suited to the requirements of the class of prospective buyers. This is a major reason for the value of the building to be less than its reproduction cost less depreciation due to aging. Sometimes a building designed by an architect can also be the victim of such a subjective assessment by another architect or the prospective buyer. In all other cases, buildings can be evaluated against such performance criteria as function, cost, appearance, quality, durability and maintenance. The value of a building is inherent in its utility.

A wrong choice of specifications is the primary cause for reduction in value of a building. Prospective buyers compare the specifications of the old building with the current specifications of new buildings of appropriate class in the neighbourhood for evaluation. Functional obsolescence greatly reduces the value of a building. Similar is the case in respect of the spatial design of a building to serve its intended purpose. An efficient layout of the internal space reduces the circulation space to an acceptable minimum. Thus planning efficiency of the layout of internal spaces is a good measure of the value of the building. Planning efficiency varies from eighty to eighty-five per cent for well designed buildings. It is the ratio of the useful floor area to the total covered area including the walls.

As a locality develops, newer buildings would have superior specifications and better space allocation. Building design must be futuristic, that is , it must consider adaptability to changed requirements in future. It affects value.

In a building, certain areas of high or critical utility also happen to be the most expensive to build. Such cost centres (as bathrooms and kitchen in a residential building) are also value centres. These are the most productive areas in terms of value. The provisions in value centres determine the class of the building. The average plinth area rate for reproduction cost of a building includes the costs of such expensive areas. It follows that in a certain class of building, the total plinth area of a building should not vary considerably from the standard. Otherwise, the standard plinth area rate is applied with a suitable adjustment. This is further accentuated as the surface area of the walls does not increase in the same proportion as the floor area. However, the combined effect on the value is marginal if the variation in plinth areas is within twenty per cent of the standard.

A prudent buyer must consider the effect of the cost of upkeep, maintenance and repairs on the present worth of a building component. However, it is not necessary to calculate the life cycle costs of all the components but only those with a short life (such as building finishes).

Development of a Neighbourhood and Market Value of a Building

The reproduction cost of a building is irrespective of where it is located. However, its value depends on the social and economic benefits derived from the facilities available in the neighbourhood and the nearby localities. In the initial stages of development of a locality, when a vacant site is available at a reasonable price, a buyer prefers to buy land and build the house according to his requirements. Even if infrastructure facilities are available, these are generally inadequate. In such a locality if the building cost is predominant, it may be difficult to find the buyer whose requirement matches the performance standard of the building. However, the property would fetch a price equal to the fair market value by Land and Building Method. As the locality develops, more benefits accrue from the additional facilities. The demand for land rises. The number of vacant sites available for sale decreases. As the land rate rises, it gives rise to an equilibrium of demand and supply. It is under this condition alone that the cost of reproduction equals the market value of a building and land (since anyone can buy the land at the market rate and construct the building)

Reproduction cost is determined from the prevailing plinth area rate (or labour rate plus cost of materials). This is ascertained from contractors or agencies employed for constructions. A separate plinth area rate for each type of construction is referred. A preliminary estimate of the cost of a building is based on the plinth area rate of the buildings already constructed. Yet, it is based on the brief specifications evolved for the building. Suitable adjustments are made for the actual specifications being different from the standard.

The building-component-wise break-up of the rate for each cost and utility centre, such as a bathroom or a kitchen (excluding the cost of structure) and finish, is considered. It helps to derive the actual cost and worth from the appropriate standard type. The development of a locality continues for a decade or more. It is likely that some older buildings are with some specifications which are now obsolete. For such buildings, physical depreciation and functional obsolescence, both contribute to accrued depreciation from reproduction cost. Due allowance is made for obsolescence by considering the salvage values of the components with specifications which are now obsolete.

As the initial development of a locality peaks, almost all the benefits are available. There are very few vacant sites available for sale. After two or three decades, it is usual to find many houses of a standard which was in vogue earlier. In such a locality, only the recently constructed buildings with up-to-date specifications, fetch values equal to the sum of the value of vacant land plus the reproduction cost of the building. This is due to the fact that the land rate in such a locality is very high for vacant lands which invariably command a premium. A few exceptionally superior buildings in such a fully developed locality fetch premiums due to the prestige or esteem value associated with them. Some features like trees, garden and landscaping cost less but take time to develop. For such elements the value-to-cost ratio is very high. In the end, the appeal value of a house tilts the balance if the financial value is acceptable. Whereas such a premium is often marginal (about ten per cent of the building value) for exceptionally well-built properties, the reductions in value is appreciable for buildings with older specifications (about ten per cent of the value of land and building). For such buildings, the fair market value is best derived from actual sale instances of properties with the same class of buildings.

TECHNICAL SPECIFICATIONS VERSUS PERFORMANCE REQUIREMENTS

To value a building, it is best to evaluate its performance. Alternatively, the actual specifications of a building are compared with the standard specifications for the type of building required by the class of prospective buyers. The analysis is based on Value Engineering concepts. The market value is derived from the standard plinth area rate by suitable adjustment for the difference, if the building is of the same class. Evidently the alternative standard specifications for each of the important building components must equally satisfy the performance requirements of the particular class.

Technical specifications of a building can be evaluated to determine the extent to which these satisfy the performance specifications, thus contributing to value. An integrated set of a technical specifications is evolved out of the required performance standards for each class of the building (appropriate for respective income group, such as V.I.P, H.I.G and L.I.G).

METHOD OF VALUATION

The factors which affect the land value also affect the value of a building but with different weightages. Investment in a building is for immediate use or return. Thus greater emphasis is placed on the requirements of the prospective buyer. These may be specified as performance specifications instead of technical specifications. These are shown in Annexure 6.1.

The building, its environment and facilities available in the neighbourhood and the nearby localities affects the value of a property. The extent depends on the extent to which these satisfy the needs of prospective buyers.

Evaluation of the actual performance as against those required by the prospective buyer group is essential to derive the market value of a building.

Determining the value of a built-up property by the Land and Building Method (as the sum of the land value derived from sale instances of vacant sites and the reproduction cost of the building), may or may not reflect the true market value. It depends on the stage of development in a neighbourhood and the condition of the building. The details required for valuation of a building are shown in Annexure 5.1. The form for Rating of a building is indicated in Annexure 5.2.

Replacement cost is the value in a stable market but not when there is a mismatch between demand and supply. Often the depreciated cost of a building is taken as its value. However, value should not be based on past expenditure but on the present value of the rights to future income.

As the land rates increases in a locality, plinth area rate of investment in new buildings also increases to optimise the returns. Buildings are constructed with superior specifications of a higher class, as the locality changes to a better class. The value of an old building is derived from the replacement cost with prevalent specifications, instead of reproduction cost of the existing older specifications. In the extreme case, the older specifications may correspond to the equivalent of the new lower class. Such a building is a severe encumbrance on the land in a high income group locality. Value of the building is then derived from the plinth area rate of appropriate lower type. The value of the property is further reduced due to the mismatch between the class of the land in the neighbourhood and the class of the building.

Sometimes an upper floor is constructed, long after putting the lower floor to use. The anticipated future, physical life of a building is generally more than its economic life. A prudent buyer is likely to maintain the lower floor upto the end of the economic life of the upper floor. This may be achieved through better performance and special repair or replacement of some building components. Value approach is proper to determine the fair market value of such a building.

Costs of building components are analysed to identify those features which are most expensive and the items of work which contribute greatly to value. Each building component can be constructed with any of the alternative set of materials such as brick walls or stone walls. To compare and decide the minimum cost at which a function can be performed, the cost of each building component (such as walls, roof or finish) is considered separately. The cost analysis should consider all the inputs of materials and labour which contribute substantially to the total cost of the building. These depend on the specifications of the building materials and labour (shown in Annexure 5.3 and 5.4.). These account for nearly three-fourths of the total cost.

Performance of the building is evaluated by Rating (As shown in Annexure 5.2). The market value is corrected for the differences in the functional worth of building from the standard.

Cost Indices for Valuation of Buildings

The overall cost index for the building and services is good enough for the purpose of a preliminary estimate. Such an estimate is used for investment decisions. However, it is not accurate enough to estimate the value for the purpose of payment as the fair market value.

It is necessary to prepare a cost index based on the materials and labour for the particular class of the building and the corresponding weightages. Typical lists for high income group and middle income group buildings are in Annexure 5.3 and Annexure 5.4. These cost indices are useful to allocate costs to various components for cost planning and value analysis based on elemental cost analysis. In consonance with the universal 'Pareto Principle' or the rule of 80/20, eighty percent of items of input materials and labour contribute to only twenty percent of the cost of the building and its value whereas twenty percent of the items contribute to eighty percent of the cost and value. For a particular type of construction, the building cost index based on about two dozen representative items of input materials and labour is adequate to prepare an estimate of the fair market value of the building component. It is prepared on the lines of the preliminary estimate. Not much of an improvement in the accuracy is gained by preparing a detailed estimate of value. The reasons are as follows:

1. An estimate of value cannot be accurately prepared from an estimate of cost. Generally owners procure the materials and award the construction work on labour rate contracts. The work may also be awarded by inviting item-rate tenders or quotations (inclusive of the costs of materials and labour). The detailed estimate is based on quantities taken from the drawing submitted to local authorities for approval. During actual execution, variations occur due to error in estimating, variation in labour productivity and the rise in market rates of materials and labour. It is easy to determine the variation in the actual cost due to an increase in the rates. However, it is difficult to ascertain the effect of errors and variation in labour productivity, on actual cost.

2. Cost studie sindicate that there is no significant increase in the accuracy of an estimate for a building (excluding items of work pertaining to services) if the number of items is increased beyond 100.

3. Labour productivity, method of construction and quality of work significantly affect the actual cost and the value of a building. It is essential to provide for these in the analysis of items of work. Yet the estimate of cost may vary from the actual by about fifteen per cent.

4. While tenders for a building work may indicate a variation of about ten per cent among themselves, the cost variation for individual subheads may differ by about plus or minus ten per cent from the average.

5. Some contractors deliberately price the items of work in initial stage of construction with a view to reduce the short-term deposit required for cash flow. Prices of materials depend on the source, credibility of the contractor, location of work and quantity ordered. The tendered cost depends on the buoyancy in the market, availability of labour, competition among contractors and the quantum of work available at the particular time of tendering. (An individual contractor can estimate the tender price correctly within ten per cent accuracy when compared to actual cost, including the effect of inflation.)

Values and Cost Indices of Building Services

The basic purpose of a building is to provide utility and comfort. There is an ever increasing realisation of the importance of the services in providing value for the cost. Even the aesthetic value is greatly enhanced by the materials and workmanship in the services. A large variety of fixtures and fittings are available. Further, there are improvement in the newer fittings coming to the market. The technology in services is improving more rapidly than for the basic building construction. Manufactured materials constitute a greater percentage of total cost of each service than for the basic building structure. The increase in the rates of manufactured materials, such as fittings, is substantially different from the items with high labour cost. Thus it is appropriate to consider a separate cost index for each of the important building services. In water supply and sanitary services, each installation complete with fittings is a value and cost centre; the cost and value of each is considered (shown in Annexure5.3 and Annexure 5.4) to assign relative weightage to each utility.

For electrical service, apart from the installations, the number of points is a cost centre contributing to cost and value index (shown in Annexure 5.3 and Annexure 5.4).

External services and development of site vary appreciably from one site to another. A separate cost index for the same is not of much help. The overall cost index is appropriate for this service. Alternatively, these are estimated for each site, based on the market rates.

Often the brief specifications of a building may indicate some items of variation from the standard specifications for similar type (such as for high income group). The variation in cost, from the standard plinth area rate of the particular type is calculated, considering the market rate of materials and labour. These pertain to the variation in specification and the corresponding weightages in the cost index formula for this type. Alternatively, the variation in cost may be calculated considering the quantity of the elements in the elemental cost analysis.

Depreciated Value of a Building

The economic life of a building depends on the standard specifications of the buildings of the appropriate type. It also takes into account the established fact, that in a developing economy, more buildings are torn down than fall down. The physical or chronological age of a building is of some help in assessing the future economic life. However, it should under no circumstances be taken as the past economic life to determine the extent of depreciation. The need is to determine the functional worth of the building as it exists.

There is a continuous pressure to improve the standard specifications of each type. This is the basic reason for economic obsolescence. The economic life of a superior building may be taken as eighty years; that for a high income group seventy years. The economic life of M.I.G and L.I.G (permanent construction) is sixty years and that for semi-permanent construction fifty years.

Value of a Building under Construction.

A property with a building under construction is sold due to personal reasons. Often it is easy to modify the building to suit the requirement of the buyer. In such a case the fair market value of the property equals the value of land plus the reproduction cost of the incomplete building less the cost of modification. The reproduction cost of an incomplete building is calculated on the basis of a stagewise break-up of the cost of a building. Since the value of the building is much less than the cost of the land, a detailed estimate is not necessary. It is based on the details for the calculation of the cost index but split up to indicate stage-wise cost and value. Incidentally, this method is suitable to assess the requirement of funds at different stages of construction. The procedure is similar to the one prescribed by financial agencies to approve a house building advance and disburse the same stage-wise.

Basic Functions of a Building

The basic functions of a building are to provide work area and passage, control environment, add comfort, maintain cleanliness, provide safety and privacy and add aesthetics. Functional worths of building components are evaluated with reference to the performance of these functions.

Finishing ages faster. Service utilities age faster than the structure due to constant use. The utilities are subject to faster obsolescence. Thus, the functional worth of service utilities which are two or three decades old accrue greater depreciation than in the straight line method based on the life of the structure. It is only in the case of the structure (excluding services and finishing) that the straight line depreciation over the whole economic life of the building is appropriate. Additional expenditure, involved in refurbishing and replacement of the finishing and the service utilities adds to the depreciation. If separate cost indices are adopted for services, the relative weightages of components is a good guide to value the replacement. However, it is not the case for buildings maintained in a good state of repairs and replacement. For these buildings, as also for very old buildings with little future economic life, the straight line method of depreciation (without replacement or refurbishing cost is appropriate). Addition of the building value with the value of the vacant site is appropriate in such cases. Interior finish is largely a matter of personal choice. Even if a building has been used for two or three years only, depreciation should include the cost of repainting.

Often an old building requires special repairs or replacement of a building element on account of structural defects. Depreciation on this account equals the cost of special repairs plus the loss in aesthetic value. Some of the common defects in the structure are as follows:

1. Rain water leaking through the roof.
2. Asbestos sheets becoming brittle with aging and getting cracked (These cannot be repaired. They need replacement).

3. *Moisture collecting behind plaster (The plaster sounds hollow when tapped).*

4. Cracks in the walls, floor or the structure.

5. Wet rot dampness in woodwork.

6. *Out of shape P.V.C pipes (due to the effect of heat).*

7. *Crazing of tiles and sanitary utilities.*

8. *Sewage gas leaking through pipe joints. (It is easily detected from the foul smell, small tree growing over or close to the pipe and indications of settlement of the ground.)*

A prudent buyer does not carry out extensive repairs to rejuvenate the building as a whole but only those components which have deteriorated more than the building and the services.

Inspection and Survey of Buildings

A survey is conducted for the purpose of preparing a preliminary estimate to determine the fair market value of a building. The specifications and the condition of the building components and cost centres are noted as shown in Annexures 5.1 and 5.2. The details shown in Annexure 5.2 are collected for comparison of the values of building components. These may also be used for more accurate 'Rating' of buildings for valuation. The building structure is inspected to identify the extent of special repairs necessary (a sample form is shown in Annexure 5.5). One important aspect of inspection is to enquire about the present trend of specifications in the neighbourhood and the market rate for a similar type of construction. These details of cost and value are noted as shown in Annexure 5.3 and Annexure 5.4

DATABASE OF BUILDINGS SOLD

A database of specifications actually adopted for buildings, (grouped separately for each class of buyers), current plinth area rates for construction and market rates for items of work is of immense help. Items pertaining to finishing, refurbishing (of flooring by grinding etc.), services and facilities may be indicated separately for each of the cost/value centres such as bath rooms, kitchen and storage. The emphasis being on derivation of market value from standard plinth area rate, it is the relative rates of items of work that matter *vis-a-vis* their performance.

SUMMARY

The value of a building is derived from actual sale instances of similar buildings by comparing their functional worths according to the performance requirements of the class of prospective buyers. A prudent buyer looks for those characteristics in a building which will benefit him. Planning efficiency of the layout of internal spaces is a good measure of the value of a building. Some areas of a building such as the kitchen and the bathroom are of high or critical utility. These are most expensive to build and are also most valuable. While valuing a building, the emphasis is on the functional worths of the building components of such cost and value centres. Thus separate cost indices for building and services are appropriate. Landscape costs less but takes time to develop. It greatly contributes to value. To value a building, it is best to evaluate its performance. Technical specifications of a building are evaluated to determine the extent to which these satisfy the performance requirements of the prospective buyer group. Building finish and services age faster than the structure. Thus the straight line formula for depreciation is not appropriate in all cases. The value of an old building is derived from the replacement cost with prevalent specifications instead of the existing older specifications. The value is further reduced if there is a mismatch between the class of the depreciated building and the class of the land in the neighbourhood. The economic life of a building depends on its specifications and also on the fact that in a rapidly developing locality, more buildings are torn down than fall down. Functional worth of a building is evaluated with reference to the performance of the basic functions by the building components. These functions are – provide work area and passage, control environment, add comfort, maintain cleanliness, provide safety and privacy and add aesthetics.

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Chapter 6

Building Specifications Based on Value Engineering

The National Housing Policy envisages the creation of a favourable environment to mobilise massive private invest ments. The objective is to provide houses for the millions according to their needs. Success of a company depends on the understanding of the customer's needs, developing the building products to meet those needs at a fair cost and convincing the user that he gets the best value for his money. In the rapidly changing environment of privatisation of the housing industry, success can be achieved by managing the forces of change such as technology, tools, talent and time. Cost estimate merely indicates where the money goes but does not help to answer the question, 'why incur so much expenditure'. The need to compare the alternative proposals for a project to select the best is keenly felt. However, absence of objective criteria for evaluation makes comparison difficult. The larger role for the private sector is expected to provide the incentive for competitive designs.

NEED FOR VALUE ANALYSIS

Value analysis helps to quantify the savings that can be achieved through competitive designs. Apart from establishing the credibility of the consultants and economic feasibility of the proposal, the process makes the scheme of incentive possible. The 'Requirements Driven Design' approach of Value Engineering optimises cost; just as the Critical Path Method optimises the time. It focuses attention on the user's needs and the basic function that the building components have to perform to satisfy the needs. This effectively answers the question, why so much expenditure is incurred on each building component. To convince a customer that he gets his money's worth, the architect has to identify the functions to be performed by each building component. He has to consider all the available alternatives (including innovative combinations of products and transfer of technology from other regions) satisfying the specified level of functions (needs) and calculate the minimum cost at which the functions can be performed. Such an analysis is based on the concept of 'Value Engineering', which, at its best, facilitates the right combination of many proven products and processes to produce an assembly that is right for the job and at the minimum cost.

People buy to benefit. Thus the purpose of the building needs to be specified clearly. Cost–benefit analysis is essential to make an investment decision. Often, return on investment is not the appropriate basis for such an analysis. A benefit is derived when a product performs the needed functions. In Value Analysis the entire cost is for functions only. Such an analysis is thus similar to cost–benefit analysis.

An architect prepares the concept design and discusses with the owner and the experts of other functional disciplines. He makes additions or alterations to suit the functional requirements.

Design reviews are done in three stages — preliminary design, construction stage and after completion. The first five per cent of the design time determines seventy to eighty per cent of the project cost and time. Thus Value Analysis, based on team approach, is most productive if representatives of all disciplines collaborate to develop the best design and specifications. Further, it helps to ensure that the scheme evolved, with the active participation of members (who have to implement the project), is not only possible but will actually work to deliver the goods.

Clients are seldom able to specify precisely what they need. Armed with his knowledge and experience, it is the duty of the architect to interpret the client's wishes and draw up the performance specifications. The product that a customer wants finally is not usually the same that he wanted initially. He learns through the development process. To avoid costly alterations during advanced stages of constructions, user's involvement is secured by his representation in the value management team. Acceptance of the product by the customer is then no longer a problem.

Changes in the technology and the relative weightages of labour and materials are reflected in the changes in building cost index over several years. For high income groups, the appeal value of a building determines its fair market value. It depends on the perception of the owner, based on value system of the society and is thus a continuously evolving phenomenon. The continuous change in the relative cost and value of building components necessitates periodical review of building specifications to achieve the optimum benefit- to-cost ratio. Value analysis helps for 'Rating' of buildings for valuation (Annexure 5.2 and Annexure 6.1, are referred).

VALUE ENGINEERING

Value Engineering is the technique of analysing the functions required to be performed by a product with a view to evolve the right specifications so that the benefit-to-cost ratio can be maximised. A benefit is quantified as the minimum cost at which the required functions can be performed and is known as the functional worth of the product. The objective of Value Engineering is to achieve the highest level of performance at the lowest possible cost. Value Engineering is basically a cost reduction technique.

Often a small increment of cost vastly improves the performance. Further, a large sum may also be saved by foregoing the luxury of a few minor secondary functions.

Value is due to functional utility and aesthetic beauty. The combination may be called 'beautility'.

A product must perform all the functions well. The first step is to list the functions to be performed by individual components of a building. Each is termed as a verb plus a noun. Examples are 'control environment', 'maintain cleanliness', 'provide privacy' and 'add aesthetics'. After receipt of the sketch drawings from the Architect, the analysis is done at the project formulation or the feasibility study stage with a view to draw up the optimum set of specifications for the building project. The objective is to achieve the desired level of performance of all the required functions at the lowest total cost (life- cycle cost). The objective is to optimise the value of a building. This is achieved by :

1. Using products with multi-function capabilities of the desired level of performance and yet the cost being reasonable. Example: translucent fibreglass roofing sheets for canopies, courtyards.

2. Using a cheaper alternative or with the desired level of performance but with marginally higher cost.

3. Using products with vastly improved level of performance of functions.

4. Identifying sources of unnecessary costs and limiting them.

As a part of the Value Engineering process, several alternative products are considered and their functional worths and costs are determined. After short-listing a few alternative sets of specifications, the ratio of functional worth to cost is determined for each alternative. The alternative with the highest ratio is evidently the best proposal.

A function is worth only as much as the minimum cost at which the desired level of performance can be achieved. The objective of Value Engineering is to achieve this target of function worth to cost ratio equal to unity.

Identification of the functional requirements and their prioritisation is done by the value management team. The team consists of members drawn from different disciplines concerned with the project.

This approach to analyse the value is not new

We generally consider whether it is worth paying so much for the product. Value Engineering is a step by step approach to search for the most economical alternative for each building component. It takes into account the long-term view of performance, reliability, maintainability and durability. It shifts the emphasis from the preliminary estimate based on production or reproduction cost to the one based on the functional worth or value-to-cost ratio. Cost is what we actually pay for. Worth is the minimum cost we ought to pay. Thus worth is a notional value similar to fair market value. The analysis is realistic when the allocation of values to functions is based on the fair market value of the building.

Value Analysis Consists of the Following Eight Steps :

1. **Information phase:** Collection of all relevant informations about

the project from reliable sources. Much depends on the correctness of the data.

2. **Function phase:** Functions required to be performed by each of the building components are identified and defined as 'Performance Specifications'. As an extension of defining the functional specifications, the technical specifications required to satisfy the performance specifications are defined.

3. **Idea generation:** A creative search for alternative products which may prima facie satisfy the performance specifications.

4. **Analysis:** Ideas generated in phase three are processed in this phase to short-list those ideas which are technically feasible.

5. **Evaluation:** Economic viability of each of the technically feasible alternatives is examined. Alternative products are graded by comparison of the levels of performance satisfaction according to the agreed criteria for evaluation and relative costs.

6. **Selection/Recommendation:** The best alternative is selected and the set of specifications is drawn, presented to the decision-making authority and then finalised after taking into consideration the appropriate suggestions.

7. **Implementation:** The project is executed according to the final specifications together with any changes that may become necessary during execution.

8. **Feedback and review of specifications for future adoption:** This step is vital to test — how far the assumptions were proved correct. This is particularly in respect of satisfaction of required functions at the predetermined cost or the extent of excess cost incurred to achieve the desired level of satisfaction.

BASIC FUNCTIONS OF BUILDING COMPONENTS

A function is what makes an item work and sell. A 'Basic Function' benefits the user and he pays for it. It is the function which a product is designed to perform. Benefits are easily identified by the prospective customer or user asking the question, "What will it do for me?" Thus, benefits are expressed as 'Basic Functions' in action terms such as **'Provide comfort', 'Maintain cleanliness'**. Generally it is not possible to eliminate a basic function from the specifications of the product without impairing the performance significantly. Only a few of the characteristics of a product benefit the customer or user directly and hence constitute the Basic Functions. The user feels the performance of these functions through his senses. Since Basic Functions only are essential, it is logical to distribute the cost of a building component among the Basic Functions that the building is required to perform. Every function must have a clearly defined cost.

As a part of the design of a product to perform the Basic Function, several other 'secondary functions' are also required to be performed by the product. These are required to satisfy the technical specifications which are unique to the particular design. Allocating costs to such functions by splitting the cost of a higher order function to a lower order Basic Function plus other secondary functions helps to look closely into the design aspects. It helps to evolve an innovative design. However, allocation of the cost to secondary functions is not appropriate for selection of the best alternative product or combination of products to develop an integrated set of specifications for the building.

Some of the Basic Functions of building components are as follows:

1. Provide work area: The extent of area and volume of space depends on the number and the nature of related activities to be performed at a work place and the movement space around the furniture and the fixtures.

2. Provide Passage: The area beyond the extent of 'work area' and used for passage only.

3. Control Environment: It is the most important Basic Function which governs the design of building components, landscape and external services. The primary function of a building is to provide shelter from the changing weather to ensure comfort and efficiency. Human comfort depends on radiation, air temperature and humidity. Basic comfort is provided by controlling the micro-environment.

   Physical processes in the atmosphere constitute the weather. These include temperature, humidity, rainfall and wind. The long-term average evolving over decades, becomes the climate. It affects man's environment in a locality. The environment consists of the landscape features including vegetation and the developments on land.

Solar radiation falling on the surface of the earth is called insolation. It is the primary cause of changes in the weather. Apart from the ozone layer surrounding the earth, clouds reflect about twenty-five per cent of the solar radiation back into space. Of the remainder falling on earth's surface, upto twenty-five per cent is reflected back into atmosphere. Light coloured, smooth and dry surfaces reflect more than dark coloured or wet surfaces. About ninety per cent of this terrestrial radiation is absorbed by the atmosphere (mainly by the water vapour, carbon dioxide and the clouds, if any). Later, the atmosphere re-radiates it partly to space and partly back to earth's surface. Apart from the latitude of a place, atmospheric composition and topography of a land greatly affect the weather condition. Thus urban climate is distinctly different from the immediate neighbourhood green belt and the rural areas.

Due to the short daily cycle, solar energy penetrates only a few centimetres below the surface. Thus there is considerable variation in day temperature. While seasonal variation depends on the climate of the region, the range of diurnal variation in temperature depends on the topography of the locality and the micro-climate. The latter spreads over an area of less than one hundred metres across.

Human body must give out heat but not too fast. Otherwise it is intolerable. A temperature between 20 to 30 degrees celcius is comfortable. Acclimatisation helps to tolerate four to five degrees centigrade beyond the limits. Planning for landscape and the control of micro-environment attempt to bring the temperature and humidity within these limits. In a hot region, the roof and the walls are finished white. It helps to reflect as much of the insulation as possible. Thus the heat gained by the building is limited. In a hot and dry region, a water body or a fountain reduces the temperature considerably. Water vapours absorb five times more heat than the ground. Evaporation takes place when the surface is wet. Similar is the effect due to trees and shade. The latter is effective even in a humid region. Large windows are appropriate at higher latitudes due to the lower altitude of the sun. These are also appropriate for cross-ventilation in a humid region. However, in a hot and dry region, small sized windows are appropriate to keep out the heat and the cold. Ethnic and native housing design incorporates many of these ideas. These are based on the age-old wisdom arising from a deep understanding of the regional climatology. Unfortunately, under the influence of the Western culture, modern Indian architecture has tended to ignore many such eco-friendly considerations. Availability of a wide variety of new materials is a challenge to the skill of the architect to select those which are in harmony with the local climate and yet is cost effective. Energy efficient design is the prime need.

4. **Add comfort:** This function provides comfort and pleasure to physical senses. While the functions, 'provide work area' and 'control environment', provide the bare functional necessities, 'add comfort' and 'add aesthetics' make the user happy. Most of the products and items of work used in the building components of low income group houses have predominantly utility functions. Apart form such utility functions, the predominant function of the product and processes used in houses for Middle Income Group is 'add comforts'. The minimal aesthetics associated with such products exists, but it does not contribute to 'Add aesthetics'. The latter function is predominantly associated with products and processes conforming to the specifications for High Income Group Houses.

5. **Maintain cleanliness:** The purpose is to maintain hygiene to preserve a healthy environment for the inhabitants.

6. **Provide safety:** It provides protection against physical intrusion of human beings, animals, insects and reptiles. It includes provision of adequate strength and stability for safety from imposed loads.

7. **Provide privacy:** It shields the residents from uncalled for intrusion through sight and sound.

8. **Add aesthetics:** Other functions affect the physical senses which can evaluate the performance of the products. 'Add aesthetics' provides the mental comfort and delight when the visual and tactile (sense of touch) senses interact with sensually pleasing objects. It accounts for the cost, over and above minimum aesthetics associated with the minimum cost of performing utility functions and 'Add comfort'.

   The value of the satisfaction of the function, 'Add aesthetics' is related to the social value system of the group of prospective buyers. Just as the western style influenced the value of the buildings in the metropolitan cities, the ancient style represented by 'VASTU' seems to influence a few buyers from conservative societies. However, the majority of the buyers do not attach much significance to such ancient styles. Hence these do not affect the fair market value of a building.

9. **Provide services:** It is the function of each of the amenities. Facilities for services include air-conditioning, supply of hot and cold water, gas, electricity, sanitary appliances, soil, waste and rain water drainage, solid waste disposal, telecommunication, network connections and terminals for music, telephone, television, data transmission and alarm system.

LEVEL OF PERFORMANCE OF A BASIC FUNCTION

User's perception of value is important. Different classes of people such as low income group, middle income group and high income group have different lifestyles. Their perceptions differ as to the prioritisation of the basic functions. 'Grades' or levels of performance of basic functions are specified to reflect the planned difference in requirements on the basis of 'functional worth to cost' relationship of critical performance requirements. Performance standards are specified in National Building Code and the Handbook of functional requirements of buildings. (of the Bureau of Indian Standards).

Characteristics of alternative products available for each building component are known. It is easy to specify the highest and the lowest level of function performance which may correspond to the requirements of H.I.G. and L.I.G. respectively. This is evident from the building specifications corresponding to the fair market value of such types of buildings.

TECHNICAL SPECIFICATIONS ARE EVOLVED FROM PERFORMANCE SPECIFICATIONS

Value Engineering assists the designer to translate the customer's values into value added features of the product. To achieve the objectives of the project, the user specified performance specifications (what is to be achieved) are stipulated in terms of Basic Functions of the building components. Design criteria critical for performance of basic functions are stipulated as technical specifications (i.e. 'how' to achieve the objectives of the design to satisfy the user's requirements) corresponding to the performance specifications (A sample is shown in Annexure 6.2) . These are specified in terms of basic required attributes of the building components to satisfy each Basic Function. To determine all the critical attributes required for each building component, a tabular matrix of building components versus required attributes can be prepared for each type of building. For evaluating alternative products for each building component, the performance of each function by the products in terms of the required attributes is noted in a tabular form (shown in Annexure 6.2). The product costs indicated in Annexure 6.2 are based on the basic cost of materials and labour indicated in Annexure 5.3 and Annexure 5.4. The level of performance is determined in comparison with the performance attributes according to the technical specification (or evaluation of comparative performance attributes of alternative products) by the Forced Decision Matrix Method. It is a quantitative technique of assigning comparative weightages using the collective wisdom of persons concerned.

Due to the high rates of urban lands, areas which remain after providing for the built-up area alone are used for trees, lawn and garden. Devoid of an integrated design, the fair market value of a building equals the sum of costs of its components according to the standard specifications followed in the area. The cost of each building component is apportioned to the basic functions to be performed by it (as shown in Annexure 6.2). For this purpose, functions are prioritised by the owner-user. The cost of each function is determined by comparison with the cost of a product which predominantly satisfies this function alone. The sum of basic function costs of all the building components for a function is the value of the function. The sum total for all the functions is the fair market value of the property. A high architectural value is achieved by an integrated design of the building and its environment (comprising trees, shrubs, garden, flower beds, lawn, fountain, sidewalks, paths, play ground and boundary) enhance the value of the property. Performance specifications for buildings and the corresponding technical specifications are indicated in Annexure 6.1.

Selection of Products for Evaluation

Only those products and processes which do not involve transfer of technology from laboratory to the field are considered. This is to make the market rate analysis realistic for each item. While considering alternative products, we may consider how similar function requirements are met in other regions of India and in other countries. To consider the minimum cost of a product to satisfy the performance criteria, all the parts of a building component or the amenities are examined to see whether each of its feature and characteristics is necessary and it contributes to benefit the user (to satisfy the basic functions). To reduce the cost, the life of each component (and its parts) is compared with the economic life of the building. The possibility of using an industrial waste product is also considered.

The product selected for evaluation must satisfy the technical specifications to be in the environment to which the building component may be subjected. Examples are the hot and humid climate in the kitchen, wetness in bathrooms and high wind speeds in coastal areas. A study in a developed country indicated that more failures occur due to faulty design and specifications than due to negligence in following the specifications. Thus, utmost care is required in drawing up appropriate specifications and in selecting the products for evaluation.

EVALUATION OF PRODUCTS

Following are the criteria for evaluation of the products:

1. **Performance of the function:** A bewildering variety of products with different grades of quality are available in the market for each item of work involved in a building component. Most products do not conform to the Indian Standards. Rarely does a product carry IS mark of certification. Under the circumstances product evaluation is a difficult task. Evaluation of a process is still more difficult. Evidently technical feasibility and function performance are the most important criteria for evaluation of products and their 'Grading'. While requirements focus attention on 'What' of performance specifications, the design and technical specifications focus on 'How' of the products. Feasibility is evaluated according to the technical standards. Thus the first step in the evaluation of the products is to list the Indian Standard Specifications and Codes of Practice (or the International specifications such as the American Society for Testing of Materials, if relevant Indian Standards do not exist) for the building component and the products and processes used in it. Standards for performance specifications and results of tests are of particular interest. Cost is

distributed among functions according to what the prospective customer would pay for it. Prioritisation of functions helps to simplify. Functions with substantial benefits alone are considered. A sample form is shown in Annexure 6.2.

A Basic Function, such as **'Provide Comfort' or 'Add aesthetics',** must inevitably include continuously maintaining the function without significant deterioration in service. The period over which the level of performance of the function is maintained, without deterioration to a lower grade, is the economic life of the product for the designated function. Often manufactured products (such as ceramic floor tiles) when new, have the same or even better performance levels than natural products such as marbles. However, the rate of depreciation of the performance level of the function 'Add aesthetics' for the two types of products vary vastly. In such a case, the present value (based on the life cycle cost) is the appropriate basis for comparison of costs of the function performance. Unless maintenance costs vary significantly, as in the case of finishing, fittings and fixtures, their effects on comparative lifecycles costs may be ignored. The reason is that precise maintenance costs are generally not known. While considering the cost of procuring, installing and maintaining an innovative product, any hidden cost that may arise needs to be included. An example is when it is made specifically for a single building.

Reliability and Durability

Reliability and durability ensure that a function performance is maintained at the specified level during the entire economic life of the product. Thus economic life greatly depends on the required level of reliability which may be evaluated through statistical quality control.

Some aspects which assure reliability are listed below:-

1. Is the design appropriate and feasible? Analysis of complaints from the user, constructions and maintenance staff and quality control check lists (based on the cause and effect relation) are helpful.

2. In case of malfunction, the cost and possibility of immediate restoration of performance.

3. Is it a predominantly manufactured item so that quality control is ensured?

4. Level of quality assurance and tolerance limits fixed by the supplier of the product *vis-a-vis* Indian Standard Specifications.

Density, impermeability and homogeneity affect the strength and durability. These are evaluated on the basis of tests according to the technical specifications. Results of the tests help to determine the life of the products. Exposure conditions affect durability. Past performance of a product (determining its economic life) is a reliable guide to durability. Economic life depends on obsolescence too. This is particularly true for fittings, fixtures and finish. Other important criteria for evaluation are:

1. **Adaptability:** It depends on the availability of good quality materials, equipment and skilled labour and ease of construction. Evaluation is based on ability to maintain quality control of technical specifications which are critical for performance of this function.

2. **Ease of operation and use of the product and its maintenance:** The database of complaints and major areas of maintenance problems is useful for evaluation of the products. Considering the service charge for day-to-day maintenance and the cost of annual maintenance, each at one per cent per annum and capitalising at twelve per cent per annum, the present worth or the equivalent cost of the total maintenance expenditure over the life of the building works out to about sixteen per cent of the cost of construction.

3. **Flexibility :** The product must accommodate the future need to upgrade the level of function performance by renovation which may also be needed due to obsolescence.

4. **Acceptability to user:** Comfort and convenience as well as visual appeal greatly depends on the individual's choice. Successful combinations are normally personal and original.

   Even if the performance of the function of a product is upto the specified level, it cannot be designated as such, unless other criteria for evaluation are also satisfied. Except for 'function performance', which has over-riding priority, prioritisation of the criteria for evaluation of products can be done on the basis of the 'Forced Decision Matrix' method.

5. **Additional criterion for amenities:** The basic function of an amenity is to facilitate human activities and hence amenities

affect individuals greatly. Thus, the key aspect in selecting appropriate products is, `How they satisfy the group of human activities to user's comfort and convenience.' While all amenities provide comfort and aesthetics, it is the degree of added comfort and aesthetics that determines the level of satisfaction and the standard of living. In view of the direct involvement of the individuals, ergonomics provides the basis to evaluate the added comfort. Its importance is next only to efficient performance of the function to facilitate the group of activities. To determine the relative importances of amenities, those which are considered most important by the user are listed and others are prioritised. For this purpose, major problem areas are identified. Similarly for each amenity the functions which are considered most important by the user are identified and others are prioritised.

VALUE MANAGEMENT TEAM

For construction of a building, the first task is to create a project planning and management team. The members are drawn from all the disciplines to be involved throughout the development process. Collaborative participation of each member in the consensual decision-making by sharing his knowledge and experience and understanding, respecting others' 'points of view' and willingness to shoulder the responsibility to implement such decisions is the key to success. The team should neither be so small as to exclude a vital source of essential knowledge and experience nor so oversized as to render consensual decision-making extremely difficult. The first task of the team is to define the consumer's requirements and evolve a concept design and an integrated set of technical specifications. This is done by translating the customer's requirements into value added characteristics of the product. Often members may agree on the overall purpose, but set different priorities according to their individual personalities and vocation. By focusing attention on the customer's requirements, value engineering ensures the success of the planning team which converts itself into the value management team. The team must have access to a thorough, correct and interactive database. Such database and libraries are the sources of information to build the right combinations of product and process ideas. Items of mass manufacture may not, by themselves, provide distinction but their appropriate incorporation as part of an aesthetically pleasing building component can enhance value.

No analysis can yield a correct solution if the informations are not correct. A set of reliable analyses as of rates for alternative products is thus essential for correct value analysis.

LIMITATIONS OF VALUE ENGINEERING

A project begins as an idea of the investor or one or more enterprising persons in an organisation. A building is a part of the overall strategy to achieve the goals. Objectives, that is, measurable results to be achieved, are set out for the building project as a part of the client's brief. The overall objectives to be achieved are broken into a hierarchy of objectives (in a manner similar to the 'Work Breakdown Structure' of the project management). The lowest level of objectives may be specified as functional performance specifications. This is done in the process of the consultation by the architect with the client to define the requirements. The architect and the client must have conviction that achievement of all the lowest level objectives that is, performance specifications will lead to achievement of the overall objective. This is a joint responsibility of the client and the consultant-architect. Since Value Analysis deals with performance specifications, it cannot ensure achievement of the overall objective. The logic inherent in the hierarchy of objectives depends on the knowledge of the client and the Consultant-Architect. It also depends on how discerning is the client. Thus there is a need for a processed and summarised database from experts and consultants. A concept plan is the result of the architect's strategy to achieve the objectives of the project. There are no set criteria for evaluation of alternative strategies, except the imprecise cost benefit analysis. At this stage, cost estimates can vary by twenty per cent and the benefits are mere guesstimates.

Each room in a building has its own personality which ties together all its functions and presents an appearance which expresses its purpose. Form evolves out of purpose. At the building component level, the purpose is more specific. Thus it is possible to draw up the function performance specifications which are quantified, write the evaluation criteria (so that products can be evaluated) and prepare a shortlist of alternative products for final selection by the architect to create an appropriate interior. Apart from providing all the functions at the lowest cost, on the basis of Value Analysis, development of an integrated set of specifications for a building has a super-ordinate goal. It gives a character and personality to the interior and expresses the same through interior and exterior design and finish. To realise the latter objective, a unique design is evolved with a central theme. The theme is maintained throughout the building. It as an assembly of ideas in which the value of the whole is greater than the sum of its parts. The full potential value of the aesthetics is realised. Further, a building must accommodate the vision and the lifestyle of its users. In the end, the appeal value of a building wins. The architect creates this esteem value by integrating the specifications and composing the building and its surrounding in a manner that integrates with the value system of the owner and the society.

It is possible to evolve an integrated set of specifications for a 'type design', considering the values attributed to the various functions by such groups of people. However, if a unique design is to be evolved to suit the user's requirements, Value Analysis merely provides a useful database of alternative products and their functions.

CONCLUSION

A study on the awareness and perceptions about the architectural quality of the public sector buildings was done by a well recognised consulting organisation. It revealed that the users and the architects in Public Service rated **'Conformity with functional requirement'** as the number one among the fourteen factors contributing to architectural quality. Private architects ranked it as the third. Layout of internal spaces was rated second. The study confirms the paramount importance of defining the performance requirements and drawing up appropriate specifications.

An appropriate set of specifications for a building ensures that right materials and processes are used which in turn guarantee performance satisfaction. By emphasising compliance with the performance specifications, it encourages doing the right things. Thus, it assures quality of performance as distinct from the present overemphasis on doing things right, that is quality of conformance.

The age-old system of preparation of a preliminary estimate as a part of the project proposal is universally adopted, even today. However, the old order of basing such estimates on traditional building specifications needs to be replaced by preparing alternative sets of specifications and selection of the best. Computers have made it easy to maintain the database of products and processes and their evaluation through value analysis.

Users perceive that architects and engineers in Government do not realise the high value associated with the harmony of the building with physical and cultural environment and are also slow in adopting new materials and techniques. Lack of adequate information about new materials and techniques is the main reason. Knowledge of the requisite attributes of a building component helps to precisely define the required product specifications. Given the proper tools and equipment, even an average worker can produce a good quality product, if the design and specifications are appropriate and well defined. Grading alternative products in relation to the levels of performance satisfaction helps to select the appropriate product for a building component. Incidentally, this process helps to grade the final product constructed at the site and in case of degradation, it helps to determine precisely the source of such a degradation and its effect on the performance. Thus, Value Engineering serves as a tool for Total Quantity Management by assisting in the process of effective communication of the cause and effect relationship.

SUMMARY

A building is designed to perform several functions. Value Analysis analyses the functions performed by each building component. The minimum cost at which the function required of a building component is its Functional Worth. A Basic Function is one which benefits the user and he pays for it. Its absence impairs the performance. Some of the basic functions of a building are: *provide work area, provide passage, control environment, add comfort, maintain cleanliness, provide safety, provide privacy, add aesthetics and provide service.* The following are the criteria for evaluation of alternative products — Performance of the function, reliability and durability, adaptability, easy operation and maintenance, flexibility, acceptability and satisfaction.

The customer's requirement are specified as performance specifications. Design criteria for performance of the basic functions are stipulated as technical specifications corresponding to the performance specifications. Alternative products are evaluated with respect to the level of performance of each function by the required attributes. Value Engineering helps to evolve a set of standard specifications for the type of building required by the class of prospective owners and users.

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Chapter 7

Principles of Valuation Applied in Practice

Real estate, the most prized possession of an individual, needs management. Management is a carefully thought out behaviour. It is based on the individual's instinct. Years of accumulated experience, wisdom and behaviour in a particular manner results in instinctive behaviour. People with similar experiences tend to behave in the same manner. This is the basis of any market study. The behaviour of the buyers and the sellers of real estate is reflected in the details of the sale instances of properties. A carefully thought out and programmed study of the collective behaviour as reflected in the facts of the sales transaction may reveal a trend of the market behaviour.

Estimating the market value of a property is a complex process. It follows the process of decision-making by the buyer and the seller to determine the market value of the property. Sale instances are indisputable facts. It is best to base the procedure of determining fair market value on these facts. To extract the principles of valuation from actual sale instances, it is helpful if workable hypotheses are pre-defined. Courts of law have laid down principle of valuation in several judgments. These help to study real-life situations, compare them with the ideal type and identify the reasons for variation from the ideal. It is then easy to quantify the effects due to these reasons.

There is a need to define the analytical approach to determine the fair market value. However, there is no Indian standard procedure for analysis of sale instances or to determine the fair market value.

There is a need to outline the procedure for analysis to apply the principles of valuation in practice. To be convincing, such a procedure must be based on actual sale instances. To be practical, the procedure must enable a valuer, a buyer and a seller to determine the price at which a property can be sold. This is a tall order. However, it is possible to outline such a procedure, as the following analysis reveals.

OBJECTIVES OF THE ANALYSIS OF THE SALE INSTANCES

1. To determine the extent of variation in land rates in a locality. To find out the extent to which the average land rate for a high income group neighbourhood is different from the land rate for a middle income group neighbourhood.

2. To find out whether actual sale instances conform to the value determined by the traditional Land and Building Method. If it is not so, to evolve a procedure to determine the fair market value of a property with a modified Land and Building Method.

3. To determine the effect of various factors on the land rate. To identify the factors whose effects on the land rate are universally true, that is irrespective of city, locality and time.

4. To evolve objective criteria for identification of comparable sale instances.

APPROPRIATE METHOD OF ANALYSIS

In the analysis of sale instances, the cause and effect relationship can be brought out if all the factors and their effects are faithfully reported. Each buyer or seller is an individual person. His decision is based on personal reasons. When the decision of several individuals are analysed, it reveals the collective behaviour. If a common trend is observed, it is possible to establish the cause and effect relationship. Existence of a trend helps to estimate the land rate from the details of the underlying factors. As in every aspect of human behaviour, variations always exist. A few sale instances do not conform to the overall trend. These are considered as exceptions due to uncommon reasons. If there were no variations from the standard behaviour in buying and selling, it would be possible to work out the land rate with a mathematical accuracy.

Statistical methods are appropriate to analyse collective human behaviour. Sale instances are merely the result of such behaviours in the real estate market. The statistical measures of dispersion determine whether a trend exists and if so, to what degree of confidence.

Two Methods of Analyses

The first method of analysis attempts to derive some principles (universal truths) from actual sale instances. These principles are then applied to determine the fair market value of a property.

What the real estate market demands and what it emphasises provide the clues to analyse the sale instances. This method has the advantage of deriving the principles of valuation from the analysis of actual sale instances. These relate to the factors affecting the land rates. The results of statistical analysis must pass the test of common sense and the knowledge of real estate business environment. The reason is obvious. Inappropriate statistical analysis may not reveal the underlying correct principles but merely indicate some ideas. Many of the ideas may not be true when tested in the market. Since figures are convincing, it is easy to be misled. One way to avoid this pitfall is to look at the set of complete data including the exceptions. The other way is to test the data for the opposite of the hypothesis.

The second method of analysis is to assume that the method of valuation established on the basis of principles enunciated in the judgements of the courts is good. This hypothesis is then tested by analysing the sale instances to determine the degree of conformity. It has the advantage of being based on established principles. It avoids a wild goose chase of new found ideas and trying to suit the statistics to make a point. This second approach is appropriate for organising and presenting the data for analysis. It is essential that the analyst must have a strong sense of the market environment such as the time, locality, the buyers and sellers, demand and supply, the social, political, economic and the real estate business environment. It helps to focus the attention on those factors which the market emphasises.

Both the methods of approach are necessary and have been adopted. In the initial phase of organising and presenting the data, the sale instances show large variations in land rates in the same locality and often in the same neighbourhood.

Why Statistical Analysis is Appropriate

The analysis of numerical data is done by statistical methods. Statistics is the collection, presentation, analysis and the interpretation of numerical data. It helps to scientifically analyse the actually observed phenomena. It is a refinement of the logical step by step thinking of the common man. It merely reinforces common knowledge. It is a tool to test whether a generally accepted principle is true.

Statistics is a logical analysis of facts. The analysis is as good as the reliability of the numerical data. It is essential that the whole set of sale instances is analysed instead of a preselected few, just to make a point. Land rates are the result of several factors and conditions operating together. It is difficult to study the effect of each of these forces separately. The analysis is complex because some of these forces and their effects cannot be measured. They can only be described qualitatively. The effect of neighbours is one such factor. In the first step, it is necessary to separate the factors which cannot be measured. The combined effect due to all the qualitative factors can be separated from the effect due to factors which can be measured. The statistical approach is basically a comparison of data.

Most common comparisons are periodwise and localitywise. The large mass of information collected are edited carefully for inconsistencies, omissions, irrelevant information and wrong calculations. The next step is to classify them according to some common characteristics. The boundaries of each locality are well defined. Thus it is easy to classify the sale instances localitywise.

Collection of Data

Relevant data are collected according to the proforma for valuation of land (as shown in Annexure 4.1, Annexure 4.2 and Annexure 2.1) and for valuation of buildings as detailed in Annexure 5.1 and Annexure 5.2. The data analysed in the present chapter relate to the period from the year 1991 to the year 1995. Sales instances of properties in several large cities in India have been analysed.

The next step in organising the data is to place them in Tables or graphs.

Organising and Presenting the Data

The graphs show how one characteristic feature of real estates varies as the other related characteristic varies. Data presented in an orderly manner facilitates proper analysis and helps to draw the right conclusions. The purpose of the analysis is to bring out the information useful for decision-making. The most common method of statistical analysis are to determine the average, the range of variation, whether correlation exists and if so, how to predict the value of a variable which depends on the other correlated variable. Inferences drawn from statistical analysis are more convincing since the results can be expressed quantitatively and precisely.

Qualitative inferences tend to be vague. These do not help to quantify the level of accuracy associated with the decision. They are subjective and are not amenable to objective evaluation. Decisions which are based on rule of thumb or intuition may be based on factors which no longer hold good now as they were at the time such rules were framed.

ANALYSIS

The measures of the central value are of great interest. An easy method is to calculate the average. This method suffers from the defect that the average is affected even by items with very small or very large values. To eliminate this undesirable effect, the standard deviation is calculated. Sale instances with land rates varying by more than twice the standard deviation are not considered while drawing the line of average land rates. The sale instances are considered as random samples representative of the rates in the locality or the neighbourhood. Eliminating the items with abnormal land rates from the analysis ensures that ninety-five per cent of the instances contribute to the result of analysis. Conclusions based on such an analysis are acceptable and give a high level of confidence.

Mean, Median and Mode

These are measures of the central values. The arithmetic mean does not always represent the value nearest to most observations. This is particularly so in the case of a U-shaped distribution in a frequency graph. The median is the value of an item at the midpoint in a distribution, arranged in an ascending or descending order of values. It is not so much affected by the values of items with very low or high values. Thus the median actually indicates what most people mean as average. In this sense, the line of average land rates drawn after ignoring the items with abnormal values may be considered as the median. Hence, it is truly representative of the trend of land rates. This concept may also be used to draw the median line of land rates in a locality. It can help to make a preliminary division of the sale instances into those pertaining to the high and middle income group neighbourhoods.

Sometimes, the value occurring most often in a distribution is of interest. It is known as mode and is easily seen from the frequency diagram as the value with the highest frequency. It is the most common value. The most common percentage effect on land rate in a neighbourhood due to the ratio of length-to-width of plots is zero.

Generally, the values of the mean, median and mode are not equal if the distribution is asymmetrical. In moderately asymmetrical distributions the following relationship exists:

Mode = Mean - 3 (Mean - Median)

Low values of mean deviation and standard deviation indicate a high degree of uniformity. An example is the dispersion of land rates in a neighbourhood, or nearly vacant land rates normalised for the effect of time, length and width of a plot and width of public access road. In contrast, the variation in land rates of properties with appreciable values of the buildings is much higher.

Correlation

Correlation analysis brings out the degree of relationship existing between two sets of variables. Existence of a correlation may be verified between the sizes of plots and the widths of the roads on which these are located. Correlation analysis establishes whether a relationship exists, whether it is significant and the cause and effect relationship. There are several methods of correlation analysis such as the scatter diagram and the graphical method. The latter is suitable for a time series data analysis. Graphs are plotted with the value of time dependent variable being measured along y-axis and the corresponding value of the time, along the x-axis. As an example, the variation in land rates corresponding to the rise in the wholesale price index with time can be easily compared to see if there is a correlation. Mathematical formulae exist to determine the extent of correlation.

A Time Series of Sale Instances

An attempt to estimate the future is always made by gathering information from the past and projecting into the future. The underlying assumption is that the trend is repeated in future. The past data is arranged in a chronological order. Generally such a time series shows the following tendencies:

1. An overall long-term trend for the values of the data as land rate tends to increase (or in some rare cases, decrease) as the

chronological date advances. Such a trend is noticed inspite of the periodical booms and recessions. To compute the trend, the period must cover atleast two complete cycles. (A boom and a recession constitutes one cycle.)

2. Changes that have taken place as a result of periodic booms and depressions in the real estate market. Generally each cycle has a duration of more than two years.

3. Sudden changes that occur due to the deliberate efforts on the part of the powers that be. An example is the liberalisation of the economy by the government. It may also be due to an unpredictable cause such as a flood, a riot or an earthquake. The effects due to some factors such as the long-term inflation and the short-term boom are additive. However, in most other cases, such as the effects due to width of frontage and length of a plot of land are multiplicative. The resultant land rate is, however, not significantly different. From the preceding discussion, it is clear that one can look for a long-term trend which is consistent and a secondary trend that is fluctuating. It requires an in-depth study of the market behaviour and a keen eye during the analysis of sale instances to discern the secondary trend. The graphic method is the simplest to discern a trend. A trend line is fitted by trial and error, keeping in view the following guidelines:

   i. The final trend line should be smooth—a straight line or combination of straight lines joined with smooth curves.
   ii. The sum of the vertical deviations above the trend lines should equal the sum of the vertical deviations below the trend line.
   iii. Sum of the squares of the vertical deviations from the final trend line should be minimum.

The above guidelines have been followed in drawing the graphs for the land rates. The result is a series of straight lines, each for one year or a part. The graph tends to resemble a second degree parabola during the period of stable increase in land rates. This is as it should be, if the annual rate of increase in the land rate is constant.

In the early developing stage of a locality, the increase in land rate is slow. As the locality develops, demand increases and the supply decreases. The twin forces of demand and supply introduces a phase of rapid increase in the land rates till it reaches a peak level. The graph is a cubic parabola. Thus the phases of steady slow growth and the rapid growth can easily be seen from the shape of the graph in these phases.

REAL ESTATE MARKET IN A PARTICULAR CITY

The demand for real estate in a city depends on the growth of business in the city. The increase in demand is partly due to the need for additional space for office or business. The other part is due to the need for additional residential accommodation for housing the people associated with the business. The number of new listings in the stock exchange and details about the correct investment are indicators of growth in general business and the following boom in real estate business. Immigration of people into a city on employment is another indicator of the future increase in real estate prices. Purchase of real estate on a significant scale by people from outside the city is a sure precursor to the rising land rate. Such a phenomenon was noticed in Bangalore, Pune and Ahmedabad after the major riots in December 1992 and January 1993 in Mumbai.

The formulation of a housing policy and its implementation is the responsibility of the State Government. Town Planning and Urban Development Acts for individual cities are the results of such efforts. Due to the pressure of population, Development Control Regulations are revised. Such a revision generally permits further development of private properties to cater to the increased demand for accommodation. These result in the appreciation of land rates. In a particular city, the revision of the permissible use of large tracts of 'industrial' land in a locality into 'residential' greatly contributed to the increase in land rates in the locality. The prospect of better development in a city attracted buyers from other cities and towns and was a factor for increase in land rates. Approval of the revised Comprehensive Development Plan, outlining the proposed schemes for development contributed to a general rise in land rates in the city. Of course, this could be sustained as businessmen from other cities were attracted, due to the opportunity for profitable investment in the city. Initially buyers were attracted to the best locality in the city. It is characterised by the highest income group residents and the availability of the best civic amenities. As the land rate in the locality reached a peak, the heavy demand shifted to the next best locality. The process continued.

This is clearly seen from the chronological increase of land rates in the localities AA and AB in city A. (Fig. 7.1 & Fig 7.2). Such an analysis helps to predict the demand in each locality at the prevailing land rate. The demand is classified as average, above average or below average.

Indicators of Lifestyles and Requirements of High and Middle Income Group Neighbourhoods

These are indicated in Annexure 7.1 in respect of the sale instances analysed. A study of the business, professional and ethnic background and age profile of each buyer according to the actual sale instance reveals the lifestyle. A change in the profile of the buyer is an indication of the change in the class of the neighbourhood. It affects the land rate. The land rates in a locality vary by about fifty percent. With such a large variation, it is difficult to derive the land rate for a property by comparing it with other sale instances in the locality. Often different classes of neighbourhoods have different land rates, though these are in the same locality. It is then necessary to derive the land rate from sale instances in the same class of neighbourhood. It may be emphasised that the lifestyle and the land rate in a middle income group neighbourhood in a locality may be higher than that of the high income group neighbourhood in another locality (Figure 7.1 and Figure 7.2). Generally, the land rates in different localities in a city are not compared for the purpose of comparing the sale instances.

Sometimes a buyer has no personal preference for a particular locality. He may compare the land rates in different localities as a prelude to make up his mind to look for a purchase of land in a particular locality. For this purpose, the localities in a city may be classified as high, middle and lower class according to the average land rates.

Characteristics Affecting the Land Rates of Different Localities of a City

The land rates in different localities primarily depend on the opportunity and convenience for business, profession and residence. Civic amenities and the opportunity for development according to the approved development plan for the city is the basis for comparison. These details are indicated in of Annexure 7.2 for localities AA, AB and AC in city A.

Increase in Land Rates During 1991 to 1995 in Locality AA in City A

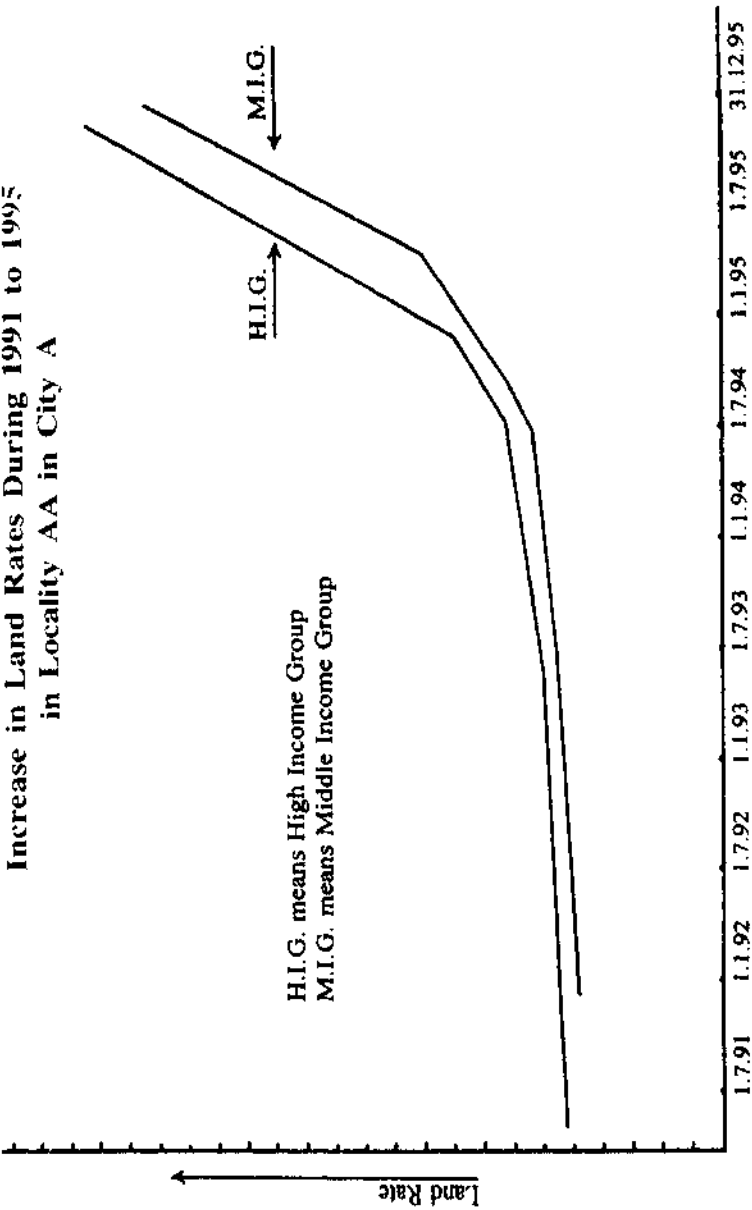

FIGURE 7.1

Characteristics Affecting the Land Rates in Different Neighbourhoods in a Locality

The same characteristics which affect the land rates in a locality also affect the land rates in a particular neighbourhood. However, the comparison is among different neighbourhoods as shown in Annexure 7.3. The additional factors specific to neighbourhoods alone are listed as follows:

Predominant Physical Characteristics of a Middle Income Group Neighbourhood

1. The average size of a plot in the middle income group is about half of the optimum and the most favoured size in the high income group neighbourhood. In the case of land with the building,the average value of a property is about half of the average value for the high income neighbourhood.
2. The phase of development is earlier than that of H.I.G neighbour hood. Thus the obsolescence of the construction is more for the M.I.G neighbourhood.
3. Average width of road is less than that of H.I.G neighbourhood.

Predominant Physical Characteristic of a High Income Group Neighbourhood

Sl. 1,2,3 of differentiation between H.I.G and M.I.G neighbourhood is based on criteria indicated at Sl. 1,2,3 in the preceding paragraphs.

4. Non-existence of any slum within the immediate neighbourhood (that is, within the area bounded by the road next to the one in front, road at the rear, road on the right and road on the left)
5. Non-existence of a Low Income Group neighbourhood adjacent to the High Income Group neighbourhood.

RESULTS OF THE ANALYSIS

Average Land Rates in Different Classes of Neighbourhoods

Graphs showing the increase in land rates during the years 1991 to 1995 for vacant or nearly vacant lands with building value less than fifteen per cent are in Figures 7.1 for localities AA, AB and AC respectively in City `A'. The rises in the land rates of High and Middle income group neighbourhoods in each localities are shown.

Increase in Land Rates During 1991 to 1995
in Locality AB in City A

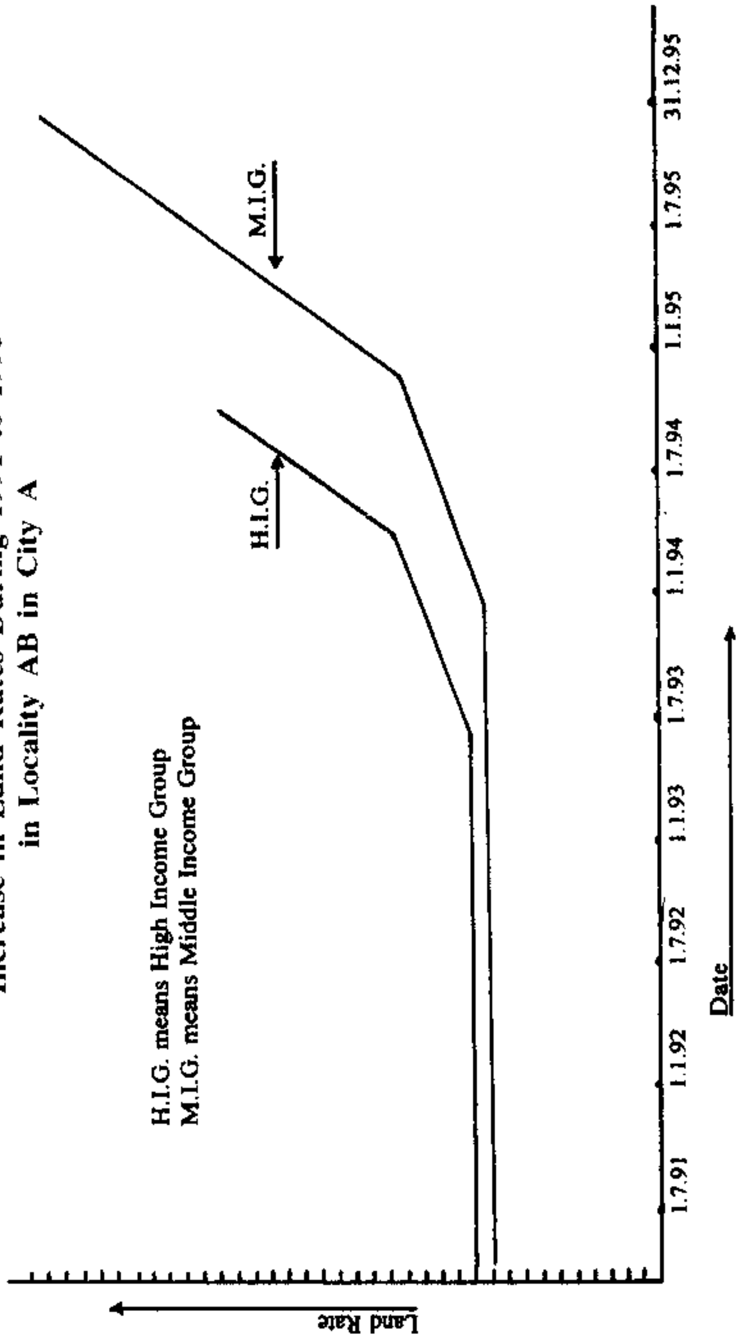

FIGURE 7.2

The land rates were normalised for the effects of physical features.

The results indicate that in the locality AB, the average land rate in a middle income group neighbourhood is about ten per cent less than the rate in a high income group neighbourhood. The reason is obvious. Civic amenities in such high class localities are more suited to the requirements of high income group. In a prestigious locality or a locality with a V.I.P neighbourhood, such as AA, the difference is about fifteen per cent. The higher difference is not due to additional civic amenities, but prestige.

From the graph of the sale instances of a developing locality AC, (Figure 7.3) it is seen that the difference between the average land rates of the two classes of neighbourhoods is about fifteen per cent. Vacant or nearly vacant plots of land were still available in the high income group neighbourhood. The difference in land rates was the least in the case of substantially built-up properties in a fully developed locality. Adequate civic amenities for both classes of neighbourhoods exist in such a locality.

Indicators of rapid increase in land rates in a locality in the immediate future

The factors causing a rapid increase in the land rates of a locality are indicated in Annexure 7.4. These do not include the common factors applicable for all the cities in the country or of any city in particular. They include the factors which contributed to the rapid rise in land rates in a locality but not so in other localities

Based on the results of the analysis, it is seen that the following indicators predict a rapid increase in land rates in a locality.

1. Rate of increase in land rates in the last one year in the locality must be higher than the average rate of increase in the city. However, it should not be because of speculation.

2. The trend during the last five years should indicate a continuous increase in the land rates except for a year or two. The annual increase in the land rate must not be less than the average for the city in that year. The increase in land rate must reflect the intrinsic worth of the civic amenities and investment in the locality by the public and the private agencies.

3. The annual rate of increase in the index of industrial production and the sensitive index of the shares of the stock exchange for

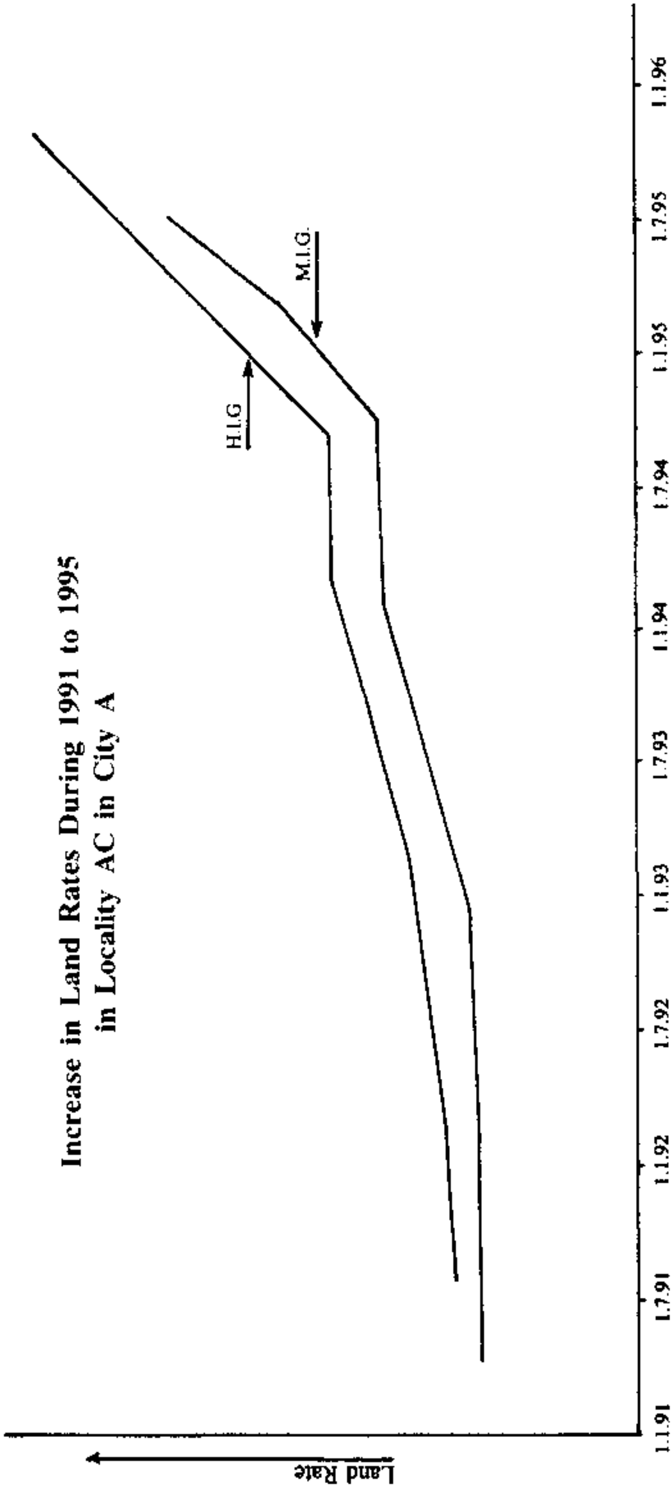
Increase in Land Rates During 1991 to 1995
in Locality AC in City A
H.I.G
M.I.G.
Land Rate
1.1.91
1.7.91
1.1.92
1.7.92
1.1.93
1.7.93
1.1.94
1.7.94
1.1.95
1.7.95
1.1.96

FIGURE 7.3

the city must show a continuous upward trend. It should be higher than the national average during the last three years.

4. Demand for real estate in the locality should be more than the average for the city as reflected by the number of sale instances during the past one year. Most of the buyers should be from the high income group, business or industry.

5. Entry of real estate developers and speculators.

6. Approval of major developmental schemes or development control rules for the benefit of the locality.

7. Steep rise in the rents for accommodation in the locality during the last one year. The rise should be more than in other localities of the city.

Applicability of Land and Building Method

Traditionally valuers have been estimating the fair market value on the basis of the land and building method. Local enquiries from private valuers indicated that the buyer and the seller generally fix the value of a property with a building constructed recently (or only a few years back) by adding the cost of construction of the building to the value of vacant land. The value due to depreciation is then deducted from the sum to determine the fair market value. It means that the value of the building is not enhanced due to a rise in cost index for construction. It gives the value of the building component less than by the land and building method. In the latter method, the value of the building is the reproduction cost less depreciation. To this is added the value of land equal to that of the vacant land. In the present analysis, the value of the building component by the land and building method was computed and deducted from the sale price of a property. The net value was of the land component. It was divided by the area of the land to obtain the land rate. The rates were normalised for the effects of physical features. The following results are seen from the analysis.

a : In a High Income Group locality :

1. The land rate of a property with a building is appreciably less than for a vacant or a nearly vacant land. The difference is upto eight per cent. The reduction is more in the case of a middle income group neighbourhood. It is about eight per cent in a market with a normal rate of increase in land rate and fifteen per cent in a market with a rapid rise in land rates. The

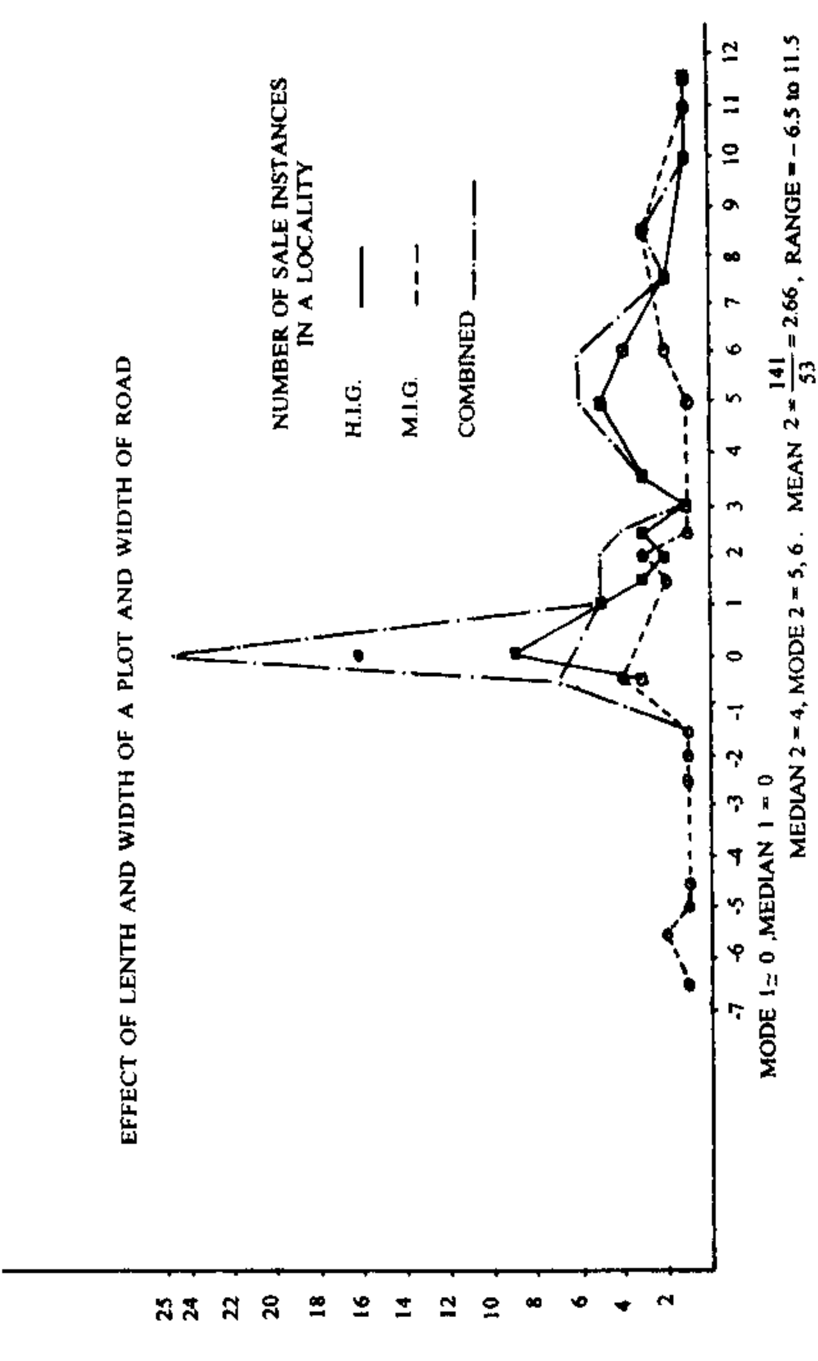
EFFECT OF LENTH AND WIDTH OF A PLOT AND WIDTH OF ROAD
NUMBER OF SALE INSTANCES
IN A LOCALITY
H.I.G.
M.I.G.
COMBINED
MODE 1 ≃ 0 ,MEDIAN 1 = 0
MEDIAN 2 = 4, MODE 2 = 5, 6 . MEAN 2 = $\frac{141}{53}$ = 2.66 , RANGE = − 6.5 to 11.5
-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12
25 24 22 20 18 16 14 12 10 8 6 4 2

FIGURE 7.4

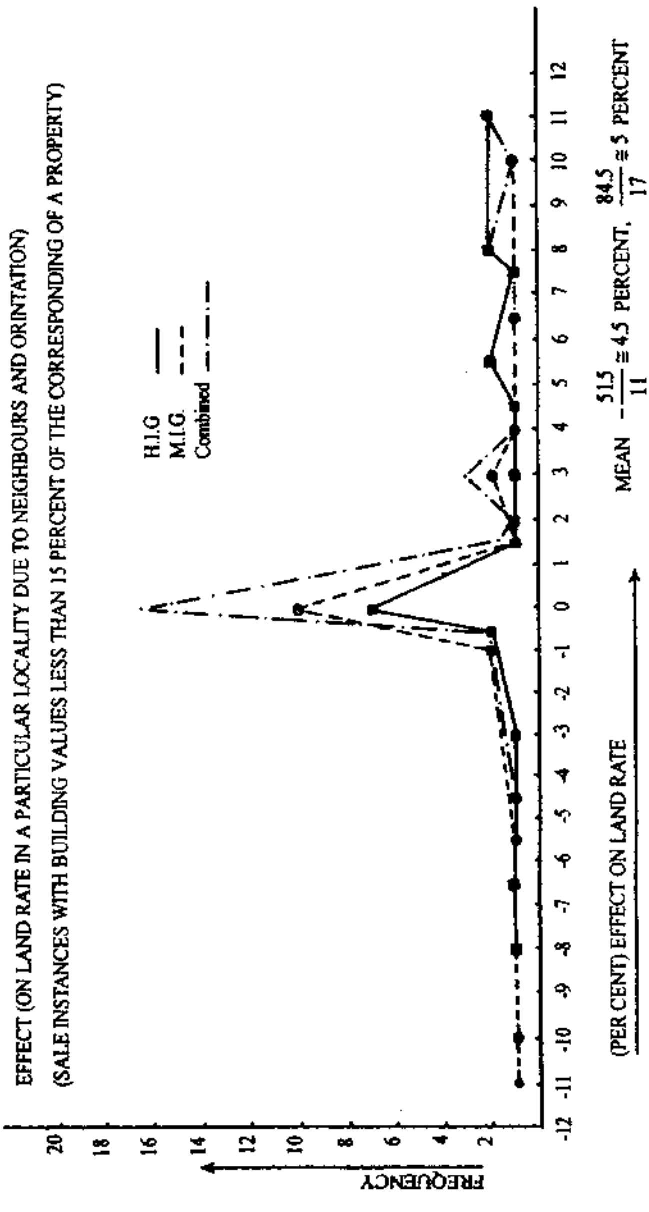
EFFECT (ON LAND RATE IN A PARTICULAR LOCALITY DUE TO NEIGHBOURS AND ORINTATION)
(SALE INSTANCES WITH BUILDING VALUES LESS THAN 15 PERCENT OF THE CORRESPONDING OF A PROPERTY)
H.I.G
M.I.G
Combined
FREQUENCY
20 18 16 14 12 10 8 6 4 2
-12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12
(PER CENT) EFFECT ON LAND RATE
MEAN - 51.5/11 ≅ 4.5 PERCENT, 84.5/17 ≅ 5 PERCENT

FIGURE 7.5

results disprove the applicability of the traditional Land and Building Method. It needs to be modified. The value approach to the valuation of the building must be considered instead of the reproduction cost less depreciation.

2. For properties in high income group neighbourhoods with building values less than fifteen per cent of the total, an attempt was made to determine the land rates by deducting the salvage values of the buildings. The underlying assumption was that high income group buyers do not assign any utility value to the buildings. This approach yielded land rates higher than for vacant lands. Presumably, the buyers assign a utility value to the building. It is higher than the salvage value but lower than the reproduction cost less depreciation. Such an approach is reflected in the value approach to the valuation of a building.

3. Often the building value of a fully built-up property in a high income group neighbourhood is about 30 per cent of the total. If the building is old, the land rate worked out after deduction of the depreciated value of the building is much less. It is nearly equal to that of the middle income group.

b : In a Middle Income Group locality :

1. In the case of properties with buildings in middle income group neighbourhoods, the land rate is only marginally lower than for vacant lands. Thus the traditional Land and Building Method is appropriate for a middle class neighbourhood.

2. The difference between the land rates of properties, with buildings in different classes of neighbourhoods, is not substantial. It is appropriate to consider the average land rate of all the properties in a locality. However, the difference is substantial when there is a rapid growth in land rates in a locality and the rate of growth is different for different classes of neighbourhoods (Figure 7.2, year 1994-95).

3. Often the land rate of a property in a middle income group neighbourhood is more than for a vacant land. This is due to the very superior class of the building. It gives the property a prestige value. Thus the land rate for a land with a building must be derived from the details of sales of properties with the similar class of buildings.

c : In a developing locality :

In the case of a newly developing locality with recently constructed buildings, there is little difference between the land rates of properties with buildings and vacant or nearly vacant lands. In such a case, the traditional Land and Building Method is appropriate.

Effect of length and width of a plot and width of a public access road on the land rate.

Analysis of sale instances in various localities in several large cities have been done. It indicates that the extent to which the variation in width of frontage, length of plot and width of public access road affects land value is nearly the same in all cities. The combined effect is indicated in Figure 7.4 for 78 sales instances in a city. Suitable tables have been developed by the author to indicate the effect of each factor in incremental steps as discussed in Chapter 4. The graph indicates that out of 78 sale instances, in 36 cases the combined effect is less than one per cent. Of the remaining 31, the most common percentage effect is five or six per cent (MODE 2). The range of variation is about 20 per cent. The analysis suggests that individual effects need not be considered if they neutralise each other.

Effect of site, Neighbours and Neighbouring Properties:

In the preceding paragraphs, how to make the corrections in the land rate for the effects of time, the length and width of a plot and the width of public access road is shown. What remains is the effect due to site particulars, the class of neighbours, values of neighbouring properties and the physical micro-environment. These factors affected the land rate by about five per cent (Figure 7.5) . Site particulars affectthe development of the site. The physical micro-environment is affected by the layout, the elevation of the surrounding properties and the landscape. These affect the micro-climate of the plot of land.

CONCLUSION

The following are the conclusions from the analysis of actual sale instances:

1. It is necessary to divide a locality into neighbourhoods. Land rates in a high income group neighbourhood is higher than in a middle income group neighbourhood. The difference is about twenty per cent.

2. The traditional Land and Building Method is appropriate in the case of newly developing localities with recently constructed buildings. It is appropriate for properties in middle income group neighbourhoods. In other cases if the building value is more than 15 per cent of the total, it is necessary to adopt the value approach to the valuation of buildings.

3. Land rate should be derived from comparable sale instances of similar properties in the same class of neighbourhood. The fair market value of a land fully developed with a building may be derived from sale instances of similarly fully developed properties in the locality. It is not essential to limit the sale instances from the same neighbourhood.

4. The combined effect on land rate due to the length and width of a plot and the width of road is about plus or minus five or six per cent. These include the effects due to neighbours, orientation, site development, local sentiments and errors of analysis. However, these do not include exceptions.

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Chapter 8

Fair Market Value of an Apartment

The decision to purchase an apartment (flat) requires the answers to two vital questions. Does the flat (apartment) meet the requirements of the buyer? Is the price reasonable and fair? The buyer can easily answer the first. For the answer to the second question, he has to enquire from the developer and find out from the market. It requires an understanding of the real estate business, the pricing system, the market study and the analysis of the sale instances. Not knowing these, most buyers depend on the precedents and their own intuitions. The result of a decision to purchase greatly affects the buyer. He can greatly benefit from an understanding of the process and seeking the information from the valuer and the real estate agent. Evolving a scientific method for valuation of flats can assist the public to make good purchases of the flats. A systematic market study and the analysis of hundreds of actual sale instances have revealed how the price of a flat is determined in the market. The procedure outlined here is the result of the study.

The owner of a flat or an apartment cannot have the exclusive right to the whole of the immovable property he owns. The rights of other owners overlap his rights. In other words, many essential rights are enjoyed in common by all the owners. It places limitations on the applicability of the Transfer of Property Act. To overcome this limitation, many states have enacted the Ownership Flats Act and the Apartment Ownership Act.

OWNERSHIP FLATS ACT

The objective of the Ownership Flats Act is to provide a marketable title to the purchaser of a flat for a residence, office, showroom, shop or a godown.

The Act lays down the following liabilities of the promoter. These are incorporated in the agreement for the sale of a flat.

i. True disclosure of :

   a. Nature of title to the land (duly certified by an advocate), encumbrances and the organisation to which the title is to be passed.

   b. Plans, design, specifications, fittings, fixtures, amenities and materials to be used in the construction of the building.

   c. Date by which possession of the flat is to be handed over.

   d. Names and addresses of the persons who have agreed to purchase the flats.

   e. Taxes and other outgoings payable.

ii. Plans and specifications of the flat are to be attached to the agreement for sale.

iii. Construct the building according to the approved plans and specifications.

iv. Not to make any alteration or addition to the building without prior consent of the purchasers of the flats.

v. Not allow persons to enter into possession until the completion certificate is duly given by the local authority (if such a certificate is mandatory).

vi. Rectify defects noticed in the building within a year of handing over possession.

vii. Maintain account of sums taken as advance or deposit and their disbursement.

viii. Convey the title of land to the designated organisation.

ix. Refund the amount paid with interest if the developer is unable to give possession of the flat by the specified or extended date.

The agreement for the sale of a flat also indicates the nature, extent and description of 'common areas and facilities' to which each apartment owner is entitled and 'limited common areas and facilities' reserved for use by certain apartment owners.

Common Areas and Facilities

These must include the following :

i. Land and building (excluding the areas for exclusive use of respective apartment owners).

ii. All service facilities provided outside individual flats. These include external services in basements, on terraces, ancillary buildings and developments on site such as lawns, gardens, swimming pool and fountain.

The title of the flat must include the percentage of undivided interest in land and other common areas and facilities (The manner of calculating its percentage is specified in the Act).

The Ownership Flats Act specifies that the promoter has to enter into an agreement which is to be registered before accepting an advance for sale of a flat yet to be constructed. The buyer must ascertain the credibility of the developer for quality of construction, delivery on time and whether the promoter has invested substantial amounts in actual construction. This precaution is to ensure that the project is not delayed too long. Thus a prudent buyer enters into an agreement for the purchase of a flat after the foundation stage. A specimen of an agreement for sale of a flat under construction is in Appendix 2.

PRINCIPLES OF VALUATION OF A FLAT

As an item of manufacture and not so limited in supply, derivation of the market value of a flat from comparable sale instances is appropriate. The market value of a flat essentially consists of four components; land, building, amenities and the promoter's profit. The overall rate per unit area of a flat in each sale instance is the sum of these four components. It is easy to derive the fair market value of a flat by comparing and deriving the market value of each component. This method has the advantage of the following the process of decision-making by a prudent buyer. Valuation of the land component follows the same procedure as the valuation of an urban land. The value approach to valuation of the components for building and amenities is appropriate. The promoter's profit depends on demand and supply.

Apart from the details as shown in Annexure 4.1 for the neighbourhood, Annexure 4.2 for land and Annexures 5.1 and 5.2 for buildings, additional informations for a flat are collected as detailed in Annexure 8.1 and Annexure 8.2 or 8.3. Relative costs of reproduction are considered for comparison of the performances of buildings and amenities. However, as explained earlier, value is not the same as cost. It is not the technical specifications of the building and the flat that matter but their ability to satisfy the needs of the prospective customer. Apart from the demand and supply consideration, the value of a flat is best determined by considering the functional worth of its components. It is based on Value Engineering concepts.

Saleability is the most important consideration. A distinctive feature has a unique selling point (USP), but it rarely fetches a higher price. Any disadvantage affecting the market value or saleability is also noted. Though the flats in separate buildings may be of similar size and specification, the common areas and facilities in each building are different. The value of such facilities account for more than half the market value of a flat. Thus it is necessary to calculate the reproduction cost of each of the facilities and the whole building to ensure proper comparison.

The calculation of reproduction cost involves many assumptions such as the interest on investment, promoter's profit and likely escalation in the prices of materials and wages. The value of a flat derived from comparable sale instances is often checked with the value based on the market rent that the flat is likely to fetch (except when the adjustment is marginal).

Effect of Demand and Supply

A long gestation period of about two years is required for a real estate development of a multistorey building or a group housing complex. Thus in the case of flats, demand is much more dynamic than supply (unless there is a steady and adequate supply of flats by large construction agencies). Generally a boom in the demand for flats follows the boom in the general business activity in the city or the locality due to shifting of business or the effect of improvement in civic amenities. Only a few real estate developers anticipate this increased demand and are ready with plans for development of lands for construction and the sale of flats. Others step in when the increased demand is evident from the increase in the prices of flats. If the increased demand as shown by the Demand Schedule D2, persists for several months, but there is

Market Prices Per Unit Vs
Number of Units Available in the Market

Curves D_1 and D_2 represent the schedules of demand versus market rate in the particular city, at times t_1 and t_2 respectively. Similarly the curves S_1 and S_2 represent the schedules of supply versus market rate at times t_1 and t_2 respectively. In the case of demand schedules, the number of units along the horizontal axis represent the number of units demanded in the market of the city. In the cases of schedules of supply the units represent the number of units available for sale.

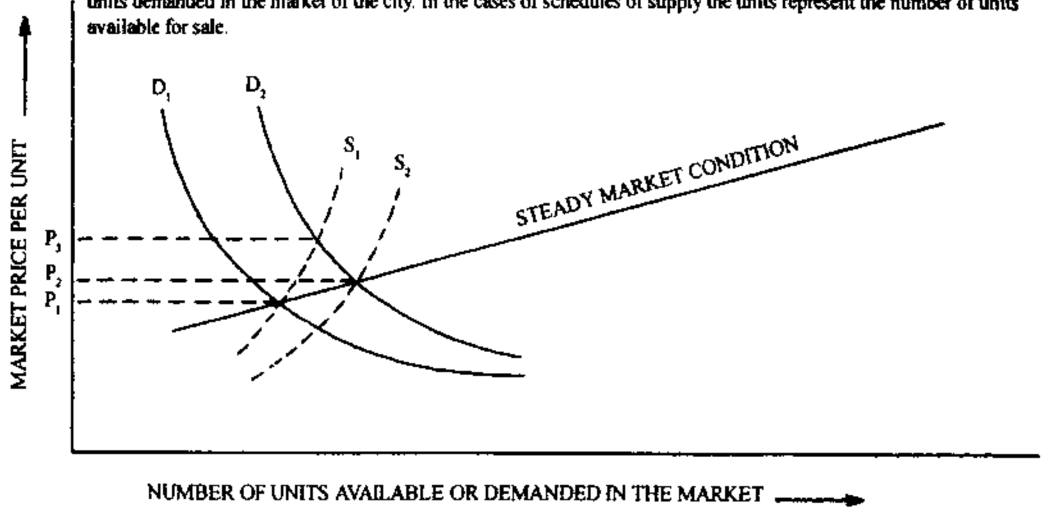

FIGURE 8.1

no immediate increase in supply, there is a steep rise in the market price of the flats (as shown in the graphs in Fig. 8.1 from p1 to p2) due to the interaction of the demand schedule D2 with the supply schedule S1. Such a rise persists until the supply is increased (as shown by schedule of supply S2) and equals the increased rate of demand, thus lowering the price (as shown in the graph from p2 to p3 in the Figure Fig. 8.1). Only a few people are forced to buy the readily available flats at the short-term increased price of flats (p2 in the graph D2 in Fig.8.1). Most people enter into agreements for purchase of flats under construction or proposed to be constructed. While the fair market value for a ready built flat in the short boom period may be much higher, that for a flat under construction is representative of a steady market condition (as shown at p3 in the graph D2 shown in Fig.8.1).

The market rate per unit area of a flat depends on the locality, the type of construction and the amenities provided. Sometimes the rates vary by more than one hundred per cent. Thus it is necessary to classify the flats for comparison.

CLASSIFICATION OF FLATS

Buyers of different income groups have separate requirements. It is appropriate to classify the flats in a city according to the income groups of the prospective buyers.

High Income Group Flats

The lifestyle of the buyers of high income group flats is similar to the requirements of the buyers of lands in the high income group neighbourhoods. Hence, these flats are in high income group localities only. The land rates in these high income group localities are very high. The value of the land component is so high (more than three-fourths of the total value of the flat) that the specification of the flat is similar or even better than the standard specifications for the high income group buildings. The class of a flat is based on the locality only. The basic reason for the high income group flats to come up in a high class locality is the proximity to a locality with high earning capacity, such as, a business locality. In such a locality, all the civic amenities appropriate to the lifestyle of the high income group are generally available nearby. There is no need for the developer to build these facilities for the prospective buyers. The high income group buyers prefer privacy and exclusiveness. Hence, they prefer living in a neighbourhood with a low density of population. Due to the higher permissible floor area ratio, flats in a group housing complex are not preferred by them. They prefer flats in a building with a few flats only. Incidentally, the lower permissible floor area ratio for a small plot limits its development. This is a welcome feature for the owners of the high income group flats.

Middle Income Group Flats

Executive efficiency is the hallmark of the lifestyle of the middle income group. It is characterised by the highest benefit-to-cost ratio. Buyers of the middle income group cannot afford high income group flats with very high rates (primarily on account of exclusiveness). Generally a locality with lower land rates lacks adequate civic amenities. To maintain the executive efficiency, adequate amenities are provided by the developer to supplement the civic amenities available in the locality. Since such a development is in a group housing complex, it is economical to provide these amenities. The bye-laws require that these amenities be provided.

Low Income Group Flats

The very purpose of low income groups migrating to the cities is to look for better opportunities for employment. They tend to look for flats in residential localities adjacent to industrial localities.

Better opportunity for employment, lower cost of livelihood and affordable price are the prime requirements of the of low income group buyers.

COMPARABLE SALE INSTANCES

Flats for one class of prospective buyers, such as the High Income Group constitutes one single group for comparison. The comparable sale instances might be located in different neighbourhoods in the same locality or in adjacent localities, but not in different localities, far apart. The group of people with interest in business or employment in one locality rarely agree to buy properties in a different locality, far away. Similar is the case for flats eligible for use as offices. For commercial use, the market value is based on the return on investment. Thus comparable sale instances should be in the same or similar commercial neighbourhoods, that is, the type of business should be the same.

Newly constructed flats (or those to be completed shortly), flats under construction and used flats are three separate categories. Comparison is made among the sale instances in the same category and of similar class such as H.I.G, M.I.G or L.I.G

How to Select Comparable Sale Instances

The objective of selecting the comparable sale instances is to derive the fair market value of a flat from these instances. The procedure must follow the logic of the prospective buyer. Evidently the permissible use is the first criterion. The requirements of the buyers of different income groups are entirely different. The market conditions of demand and supply are different for the different classes of the flats. Evidently the market value of a middle income group flat cannot be derived from the sale instances of the flats of high income group. It is easy to compare the sale instances if they are in the same locality or at least in similar localities. Land rates in a locality vary by about fifty per cent. For appropriate comparison, the sale instances of the flats should be in the localities with average land rates varying by not more than fifty per cent. The standard specifications for the high, middle and the low income group flats in a city are well-known to the prospective buyers. By comparing the actual specifications of a flat with these specifications, it is possible to classify its construction. Evidently the type of construction of the comparable sale instances must be similar. The scale of amenities provided for flats vastly vary according to the income group of the prospective buyers. These also help to classify the flats and select the comparable sale instances.

FACTORS AFFECTING MARKET VALUE OF A FLAT

Evidently factors which affect the values of the land and the building also affect the value of a flat. Other factors of particular importance to determine the value of a flat are the following :

Locality and the Class of Prospective Buyers : The reproduction cost of a flat is nearly the same in any locality of a city. Yet, the fair market values of the flats vary vastly. The high demand for flats in decent localities with a similar class of high income group neighbours pushes up the land rates for big size plots (suitable for the construction of flats) due to the higher permissible floor area ratio. The component of land value is a small price to pay because the buyer of a flat greatly value the advantages of living in a decent locality. The high value of the land component ensures that the flats, buildings, and the amenities are constructed to a high standard.

People who cannot afford the high cost of flats in such posh or central localities have the following options. They buy the older flats with inferior specifications prevalent in earlier times in these localities or opt for new flats with less cost specifications and lower land rates in the middle income group localities. Evidently the value of a flat for high income group cannot be derived from those of a middle income group and vice versa.

Owners and Occupants in the Building : A person is known by the company he keeps. Thus the value of a flat is greatly influenced by the owners and occupants in a building; more so by the neighbours in adjacent flats. It is easy to change the specifications of a building to a higher type, but it is not possible to change the neighbours. Thus the classification of a flat depends very much on the class of the locality and the neighbourhood. It depends less on the type of construction. The effect is more in the case of the resale of a used flat than for a flat under construction.

Type of Development and the Class of Prospective Buyers : Buying a flat for use involves the commitment to cooperative living. Thus the first step is to identify the class of prospective buyers and ascertain their requirements. Once the economic and the ethnic background of the buyers, their lifestyles and requirements are defined, it is easy to compare the requirements with the specifications of the flat, the building and amenities including open space and recreational facilities. Non-availability of such facilities is a barrier to motivate prospective buyers of higher class even with superior specifications in the buildings and flats.

Area of the Flat, Common area and Floor area Ratio : The object of maximum benefit to the buyer is the provision within the boundary of the flat meant for his exclusive use. The area of a flat depends on the class of the prospective buyer. The common areas and the services are available to the buyer as an undivided share. Their contributions to the value of a flat is indirect. There is an optimum proportion of the common area to the area of a flat for each class of buyers. An excess of common area increases the superbuilt area to be paid at the same rate as for the flat but does not contribute fully to its value. A developer aims to maximise the profit. Rarely a land is developed with an actual floor area less than the maximum permissible under the Development Control Regulations.

All buildings must conform to the bye-laws framed by the Local body. These represent the minimum standards to ensure the health and safety of the inhabitants. In their anxiety to make profits, developers often exploit the loopholes in the provisions of the bye-laws. They construct an excess of superbuilt area over that permitted by Floor Area Ratio applicable for the plot of land. There is little reduction in the market prices of such flats. The demand for these flats depends on the degree of enforceability of the Development Control Regulations and the bye-laws. Such excesses are uneconomical to the buyers of the flats.

Location and Orientation of the Flat : These have only marginal effects on the prices. Flats with better location and orientation get sold earlier. The rates vary by about one per cent per floor with respect to the floor most sought after. The range of variation is plus or minus two per cent. The price addition is substantial for additional facilities, such as the exclusive use of a part of the ground or the terrace. The extent to which these affect the market prices of the flats depends on the perceptions of the prospective buyers. A developer closely studies the market and evolves an equitable formula for the adjustment of the prices. It is best to ascertain these details from the developers.

Common Amenities and Level of Satisfaction : The value of a flat is greatly affected by the availability of open space and facilities for recreation purposes. Such as parks, gardens, swimming pool, club, shopping centre and gymnasium. Common amenities also include such facilities as lifts, generators, staircase and passage. It is useful to determine the component of value of a flat for common amenities. Better amenities for a group-housing cost less to the developer, but greatly enhance the market values of the flats to the intending buyers (due to value-added services).

FACTORS AFFECTING MARKET VALUE OF A FLAT UNDER CONSTRUCTION

In the case of a building yet to be completed, there is an uncertainty about the anticipated date of completion, quality of construction and the class of future neighbours. While the demand for such flats is less, the developer is in dire need of money required for the construction. It is the most difficult for a developer to sell the first few flats. Thus the sale price of a flat is appreciably lower in the initial stage of construction. The developer may agree to sell even at cost price. He makes up the profit from later sales. The price increases as the number of flats sold increases and the construction nears completion. The increase is more than due to the rise in the cost index. If a few flats remain to be sold, the developer charges a high price for those flats. It is not advisable to derive the market value of a flat in the initial stage of construction from the sale price of a completed flat in another building. However, it is possible to derive the market rate of a completed flat from that of a flat under completion, that is, when the structure of the building is complete but the doors, windows and the fittings are yet to be fixed.

Undivided Share of Land

The buyers of the flats pay for the respective undivided shares of the whole land. Yet, in some cases, the title for the land covered by the building alone is transferred to the buyer and the balance is conveyed to the `Association of flat owners' much later. Development of parks and other facilities on the remaining land is delayed abnormally. Until such time, the land remains in the possession of the developers. The developer reserves the right to make additions or alterations. Apart from the legality and morality of such a provision in an agreement, it is a significant encumbrance.

Schedule of payments

In the initial stages of construction, the developer requires money to carry on the construction. Thus a discount is given to the buyer who makes a substantial initial payment at this stage. It saves him the additional price rise due to cost index and the interest otherwise payable in the case of payment by instalments. The element of risk of advance payment depends on the credibility of the developer. For future payments, the rate of interest is marginally higher (by about three to six per cent) from the rate of interest charged by the banks.

Anticipated Dates for Occupancy Certificate, Possession of the Flat and Availability of Amenities

The market value of a flat under construction is the present worth of its future possession. Thus the anticipated date of acquiring possession of a flat greatly affects its market value. Similar is the case for amenities. The Ownership Flats Act provides that possession shall not be handed over until the completion certificate is obtained from the Local Authority. The expected date of handing over the possession of the flat greatly affects its market value.

Credibility of the Developer

The market value of a flat greatly depends on the credibility of the developer to ensure the quality of construction and timely delivery. The type of the risk involved in the development and the likelihood of the progress of the construction to be commensurate with the schedule of payment is reflected as the credibility of the developer.

ADDITIONAL FACTORS AFFECTING MARKET VALUE OF A USED FLAT

Depreciation in the value of a flat is due to use and obsolescence. Thus the market value of an old but unused flat is not reduced due to depreciation.

Depreciation due to use and obsolescence

The economic life of a flat in a load bearing building is about 60 years and that in a reinforced concrete structure, 80 years. The economic life of services is 30 years for amenities and fittings and 30 to 50 years for the piping system depending on the type of the installations and the standard of maintenance. The economic life of internal and external finishes, which largely account for the aesthetic value, varies from 2 to 5 years only. However, the value is largely restored by periodic maintenance and repair. Some developers provide better and more permanent external finishes. For internal finishes, sometimes ceramic tiles are provided. These are less costly. Their economic life is less than that of permanent finishes such as mosaic tiles or marbles. Services and the finish account for a substantial part of the value. It is appropriate to calculate the depreciated value of these separately, if they were recently renovated or are too old as compared to the depreciation of the building. The expenditure on the maintenance of a newly constructed or unoccupied flat is negligible in the initial years. Thus the usual depreciation, based on the economic life of the structure is appropriate. However, if the flat has been used for more than a year or two, it seems appropriate to allow for a higher depreciation of about five or ten per cent. If the flat was used for five years, the depreciation is about fifteen per cent.

Apart from the depreciation due to use, functional and economic obsolescence (due to shifting of economic activity or population) also affects the market value.

Maintenance and Upkeep

These greatly influence the market value of a used flat since the quality of the services affects the occupants of a flat directly. Apart from the quality of materials and installation of such services, their smooth performance is vitally dependent on the quality of maintenance and upkeep of the building.

DATA REQUIRED TO VALUE A FLAT

The most important information is to the reputation of the developer with regard to the quality of construction and timely completion. If a sample flat has been constructed, a lot of ambiguity is resolved.

The next step is to examine the agreement for the extent of the marketable title. While the area of the flat is clearly delineated in the drawing appended to the agreement of sale of the flat, other common areas and facilities are listed in the agreement and are shown in the plans approved by the local body. Copies of the approved plans and other documents are obtained from the developer. The format for the collection of the data for the classification of the neighbourhood is similar to that for the land. The format for collection of data regarding the type of construction is the same as for land and building. Additional data to be collected for valuation of a flat are indicated in Annexure 8.1. Comparison of the values of building components of flats is based on the cost index. The latter is based on the cost of materials and labour as shown in Annexure 8.2 and Annexure 8.3. For internal services, the details are similar as shown in Annexure 5.3 and Annexure 5.4. Details of external services are shown in Annexure 8.4.

PROCEDURE TO DETERMINE MARKET VALUE OF A FLAT

The fair market value of a flat is the sum of its four component values. It consists of the undivided share in the land, common areas and facilities (including the portion relating to limited common areas and facilities), the flat/apartment proper (meant for the exclusive use of the apartment owner) and the promoter's profit. It is easy to determine the values of these components from the details which can be obtained in terms of the Ownership Flats Act. The Act specifies that the promoter shall give true copies of all documents relating to the title of land, plans and specifications of the building built or to be built and the plans and specifications of the flat to be sold. The adjustment for the difference in the cost ignores the effect of important factors such as the location and orientation of the flat, the stage of construction, the number of flats remaining to be sold and details of other owners and occupants of flats in the building. Thus the values of the four components of the value of a flat are derived from actual sale instances of flats in the same building or similar class of building. The fair market value of a flat is the sum of the values of its four components.

Procedure to Determine the Market Value of a Flat yet to be Constructed

The rate of interest prevalent for payment in instalments for flats under construction is ascertained. Based on this rate, the present worths of the future possession and of payments are calculated. The sum of the discounted value of future payments and the payment as on the date of agreement is the sale price consideration. If there is a clause in the agreement providing for cost escalation to be paid, the discounted sale price is adjusted accordingly.

It is rare that the construction is completed and the possession of the flat is handed over on the date stipulated in the agreement. Considering the stage of construction on the date of inspection, the valuer makes a realistic assessment of the date by which possession of the flat is likely to be given.

The market value of a flat yet to be constructed is less than the present market value of a completed flat by the amount of discount for the period from the future date of possession upto the date of agreement. The rate of interest is the same as for the immovable properties. The cost equals the market value of land and the already constructed part of the building plus the present worth of the future construction. For fair market value, both should be equal.

Market value of a flat under construction, (A) =

Market value of a completed flat
- Discount for the period upto the date of possession.
Market value of completed part, **(B)** = Investment
+ Interest on investment + Agency charges on investment = (Reproduction cost on date of agreement - rise due to cost index)
+ Interest on investment + Agency charges
- Reproduction cost on date of agreement
+ Agency charges on (Reproduction cost - rise due to cost index)

Present value of balance work yet to be completed with finance from payments according to the agreement, **(C)** = Present worth of reproduction cost of balance work as on the date of agreement + Rise in cost index for half the anticipated period of completion + Agency charges = Reproduction cost of balance work as on date of agreement + Agency charges on such reproduction cost

(A) = **(B)** + **(C)**.

This is the basis to determine the market value of a flat depending on the schedule of payments. The market rates of the flats are revised every month, based on the market study. The developer provides for the market value of the land and the already constructed portion in the first instalment itself. The apparent consideration or the present worth of future payments equals the discounted value of future payments at the rate of interest equal to the rate of rise in cost index for construction. (This is not the case under the provisions in Chapter XXC of the Income Tax Act.)

Steps to Derive Fair Market Value of a Flat

The permissible use of the flat is ascertained. For each type of use, the next step is to classify the flat as high, middle or low income group type. This is done in the following steps:

1. The classification of the neighbourhoods is identified
2. The type of construction is identified on the basis of the size of the flat and the specifications of the building and the amenities.
3. The flat is classified according to the results in the steps 1 and 2. If these do not tally, the class of the flat is the lower of the two.

4. The classification is reviewed by comparison with the sale instances of the same class in the locality or similar localities nearby.

Steps to determine the market value of a flat from the comparable sale instances of the same type of use and the class are the following:

1. The ownership rights are determined. The Ownership Flats Act or the Apartment Ownership Act is referred (if applicable).
2. From comparable sale instances of the flats, the component of the land value is determined. Suitable adjustment is made for the difference in the land rate due to the actual floor area ratios.
3. Based on value analysis, the component of the building value is derived from the components of building values of comparable flats.
4. Detailed information about the factors affecting the sale value are ascertained. Suitable adjustment is made for each of the factors.

CONCLUSION

Economic liberalisation is expected to boost business activity in urban areas. Generally economic boom is followed by a boom in real estate business. Coupled with the withdrawal of subsidy on urban infrastructure by the public bodies, the only urban growth possible is vertical growth in inner parts of the cities through construction of multistoreyed buildings. The steep rise in land rates coerces the prospective buyers to settle for flats instead of independent bungalows. Old people and families with both spouses working usually prefer flats for security and other reasons. Many states have enacted laws to facilitate ownership and transfer of flats. The scientific method for valuation of flats will facilitate financing of construction of multistoreyed buildings through appropriate evaluation and create a conducive environment for development of the market for flats.

SUMMARY

The prospective buyer of a flat looks for the answer to two vital questions — Does the flat meet his requirements? Is the price reasonable and fair? The owner of a flat enjoys many essential rights in common with other owners of flats in the same building. Often this aspect limits the legal transfer of a flat. The Ownership Flats Act and the Apartment Owners Act overcome this limitation. The former requires the developer to make the true disclosure of the details vital to the interests of the prospective buyers. A prudent buyer ascertains the credibility of the developer for quality of construction and delivery on time and whether he has made a substantial investment in the construction. As a manufactured product, the market value of a flat is derived from comparable sale instances. The market value of a flat consists essentially of four components; land, building, amenities and the promoter's profit. It is easy to derive the fair market value of a flat by comparing the components of the market values of the flats. The valuation of the land, building and the amenities is similar to the valuation of lands and buildings. The promoter's profit depends on the demand and the supply and the stage of the construction. Due to the large variation in the market rates, flats are classified according to the income groups of the prospective buyers. Sale instances of the flats in the same class alone are comparable. Factors affecting the market value of a flat are — locality, type of the building, other owners and occupants, area of the flat, common areas, common amenities, location, orientation, stage of construction, undivided share of land and the schedule of payment. Other factors affecting the market value of a used flat are — depreciation (due to use and obsolescence) and the standard of maintenance and upkeep. The market value of a flat yet to be constructed equals the sum of the values of the existing real estate and the present value of the future construction. It is not possible to derive the market value of a flat yet to be constructed, from the market values of completed flats. The market value of an old but unused flat is not reduced due to depreciation. If a flat has been used for at least one year, the depreciation is about five per cent.

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Chapter 9

Valuations of Flats Applied in Practice

Demand and supply regulate the market values of flats. It is not difficult to estimate the supply of flats offered for sale, but it is difficult to estimate the demand. Demand depends on the requirements of the prospective buyers and the market price of the flats. Both are interdependent. In such a complex situation, it is best to follow the process of decision-making of the prudent buyer. The market for flats is not so restricted and rigid as that of the urban land. It is elastic enough to follow the economic laws of the market.

A study of the chronological increase in the rates of flats helps to determine the trend of the rates. It helps to estimate the market value of a flat based on past sale instances. However, to find whether the market value is reasonable and fair, it is necessary to find out the factors which the market emphasises for value. This is done through an analysis of the sale instances. The value of a flat may be divided into four components — land, building, external services and promoter's profit. Knowing how the factors affect each component helps to find the reasons for the variation in rates of flats. It is easy to determine the reasonable variation in rates of flats by a systematic market study of each of the component values.

OBJECTIVES OF THE STUDY

To determine :

1. Whether there are distinct classes of flats? If so, how

can the flatsbe classified to identify comparable sale instances ?

2. The percentage variation in the market rates due to
   a) the location of the flat in a building; and
   b) the ratio of super-built area (for payment) to the permissible floor area.
3. Percentage difference in the rates for flats in the different phases of construction, that is, foundation, super structure and finishing.
4. Chronological variation of rates of flats as compared to the variation in the land rates and the variation in the cost index for construction.
5. Variation in the promoter's profit
   a. On the sale of flats at different stages of construction.
   b. Due to variation in demand and supply.
6. How do the resale values of old flats compare with the market values of flats under construction?
7. How to identify comparable sale instances of flats and derive the market value of a flat from these sale instances?
8. Whether it is more profitable to develop with better specifications and amenities than by providing more open space by reducing the floor area ratio, in a locality with (a) high land rates and (b) with low land rates?
9. In the outlying areas of the city, when is it more advantageous to buy a flat than buying a plot of land and constructing a building on it?

METHOD OF ANALYSIS

For a proper comparison of sale instances, these must be in the same locality or in a similar locality with comparable land rates. The comparison of the components of values of the buildings and the external services is based on the value approach in the valuation of buildings. In case of flats under construction or completion with modern specifications, the market value of a flat is adjusted for the difference in the cost of construction of the building and the services. The adjustment for the land component is done on the basis of market rates of the lands in the respective locations. Then what remains is the component due to the promoter's profit. The break-up of the overall rate of each flat into its components helps to study the chronological variation in the rates of flats due to each factor.

Sale instances in the same phase of the market of the real estate business alone are compared since the chronological rise in the land rates and the cost of construction are also in the same phase and are gradual. The percentage of promoter's profit remains unaltered in the same phase of the market of real estate business. A very large difference in the percentage of promoter's profit indicates that the sale instances are not in the same phase and hence are not comparable.

The chronological variation in the market rates of the flats is plotted as a time series graph. The overall rate of each sale instance is split up into the four components. The value of each component is marked on the graph as shown in Fig 9.1 and Fig. 9.2.

The time series graph of the cost of construction and the external services is similar to that of the increase in the cost index over time. The chronological increase in the values of the land component and the promoter's profit are also plotted.

The effect of the location of a flat in a building is ascertained from the developers. The market prices of all the flats in the same building in the same stage of construction are compared. The study is done for flats in many buildings to obtain a statistical average. The variation in rate due to location is generally about one to two per cent per floor. The maximum variation on this account is within five per cent. Adjustments on this account have been made before plotting the graphs for analysis.

CLASSIFICATION OF FLATS IN A CITY

The land rates in a locality vary by about 50 per cent. While a High Income Group Flat must be in a High Income Group neighbourhood, a Middle Income Group flat can be anywhere in the locality, except the worst. The value of the land component in the market rate of a flat is about 40 per cent. The variation in land rates and the difference in the values of land components, due to the variation in floor area ratios of development account for $(50+25)* 0.40 = 0.30$ or 30 per cent of the overall market rates of the flats. (Low Income Group flats are in Middle or Low Income Group localities. The present study does not include sale instances of such flats).

The difference in the costs of construction according to the specifications for the High Income Group and the Middle Income Group is about 25 per cent. Though cost is not the same value, it is equivalent to $0.25 * 0.40 = 0.10$ or 10 per cent of the rate per unit area of a flat.

The vast difference in the amenities provided for the high and the middle income groups is about 50 per cent of the value of the amenities. It is equivalent to $0.50 * 0.20 = 0.10$ or ten per cent of the rate per unit area of a flat.

Accordingly the difference in the rates of the High and Middle Income Groups comes to about 50 per cent. This criterion is apt for flats in a building already constructed or nearing completion.

IDENTIFICATION OF COMPARABLE SALE INSTANCES

Values of flats to be constructed cannot be compared with values of completed flats.

Often a flat is sold when a structure is still under construction and the flat is yet to be completed and handed over (without any additional payment than what was agreed). The value of such a flat yet to be constructed equals the present worth of the value of the flat on the future date of completion. In such a case, the rate per unit area of the flat is much less than that of a flat completed or nearing completion. The difference depends on the stage of construction (though the price includes the cost of future construction also). The value of such a flat is determined from an analysis of the process of development. Soon after development, the buyer pays for the land value. He pays for the cost of future construction in advance. The value of a flat in an early stage of construction is equivalent to the value of the land plus the present worth of the future cost of construction. It is evident that the value of a flat in a building whose construction is yet to be started cannot be compared with that of a flat nearing completion or already completed. The values of flats under construction or completion alone have been compared.

Middle Income Group Flats are not Comparable with High Income Group Flats.

The cost of construction of different classes of flats are compared easily from the plinth area rates. However, value is not the same as cost. The demand for High Income Group flats may not be similar to that for Middle Income Group flats. This is evident from Fig 9.1 and Fig. 9.2 showing the difference in the promoter's profit for the two classes. From the discussion in Chapter 4 and Chapter 7, it is evident that the land rates for lands in a High Income Group locality (or neighbourhood) cannot be derived from those in a Middle Income Group locality (or neighbourhood). Thus the values of land components of the rates for flats cannot be compared if the prospective buyers of flats belong to different income groups. Evidently flats of different classes are not comparable.

A Used Flat cannot be Compared with a Flat Under Construction

Maintenance and upkeep affect the depreciation in the value of a flat. The value of the building component or the cost of reproduction does not represent the correct market value. Often the vital specifications of the used old flats do not conform to the modern specifications. Further, it is not easy to replace these specifications. In such a case, it is not proper to compare the value of a used old flat with a new one.

The value of an old flat is greatly affected by the neighbours. This is evident from the actual sale instances of flats . These indicated a much wider dispersion of the rates than of flats under construction. Further, these instances indicate that the market rates of used flats are more than those of flats yet to be constructed but less than of flats under construction. This is evident by comparing market rate of used flats as shown in Fig 9.1 and Fig. 9.2. Evidently it is not desirable to compare sale instances of old flats with those of flats under construction.

STANDARD DEVIATION

The degree of dispersion of data is measured by the standard deviation. The deviation is ascertained separately for each class of flat. It is a measure of the reliability of the data for correlation of market rates of flats with the factors affecting the rates. Theoretically the anticipated deviation is as follows:

For a Middle Income Group flat, the component of land value is about 40 per cent. The construction of the building and the amenities (including common built-up areas) account for about 40 per cent and 20 per cent respectively of the value of a flat. The balance of 40 per cent accounts for the land component.

(These values include the corresponding elements of the promoter's profit)

The variation of land rate is about 15 per cent even in the same class of neighbourhood. The difference in the floor area ratios of construction may account for variation upto 15 per cent of the component of the land value. Thus the difference in the components of the land value comes to 0.30 * 0.40 = 0.12 or 12 per cent of the rate per unit area of the flats.

The variation for some changes in the specifications of the building and the amenities is about plus or minus 10 per cent of the cost of construction for the same type of flats. The effect on the overall rate of flats is about plus or minus 6 per cent. Thus the overall variation should not be more than about plus or minus 12 per cent of the average rate. For High Income Group flats, the variation in the value of each component is less than for Middle Income Group flats.

From the study, it is seen that the average deviation of the actual rate from the line of the average rates as shown in Fig.9.2 is about five per cent. Excluding five sale instances with exceptional rates (out of fifty-eight sale instances) the maximum deviation is seen to be 11 per cent. It shows that statistical analysis is appropriate to derive the fair market value of a flat from these comparable sale instances. The average percentage of deviation in the rates of actual sale instances from the average rate of High Income Group flats is similar.

DEGREE OF ACCURACY

The degree of accuracy of the land component of the market value of a flat is the same as that of the market values of lands in the neighbourhood. As indicated in Chapter 7, the error is about plus or minus five per cent from the average rate. The degree of accuracy of the cost of construction of the building and the amenity components is the same as that of the preliminary estimate for cost of construction. Thus the error in the value of the building component is about plus or minus five per cent from the average rate. The degree of accuracy of the component for the promoter's profit is the same as the one for the development method of valuation. The marginal effect on the market rate due to each of the minor factors affecting the value by less than one per cent are clubbed together.

COLLECTION OF DATA

Relevant data are collected according to the proforma specified in Chapter 8 on fair market value of a flat. Important factors which affect the fair market value of a flat are noted in a computerised database of sale instances. The profoma is indicated in Table 9.1.

Table 9.1
Proforma for Prepering Computerised Database of Sale Instances of Flats

Locality
Address
Date of agreement
Consideration
Super-built area of flat
Rate per square metre of flat
Floor on which situated
Total area of land
Permissible Floor Area Ratio (F.A.R./F.S.I)
Total super-built area
Year of construction
Reproduction cost of building
Cost of external services
Advantages (affecting value)
Disadvantages (adversely affecting value)

Characteristics of Flats of High and Middle Income Groups

Sale instances of flats for High Income Group are in localities with very high land rates. The civic amenities required by this group are generally available in the locality. Middle Income Group flats in the developed localities in the city have better specifications for the flats but the scale of external services merely conform to the minimal requirement of the local bye-laws.

Middle Income Group flats in developing localities within the corporation limit are provided with all the civic amenities and better recreation facilities to make up for the inadequacy of the development of the locality. These characteristics of the flats are indicated in Table 9.2 for the sale instances of flats in a particular city.

Table 9.2
Characteristics of Analysed Flats

Characteristics	H.I.G. Flats	M.I.G. Flats
Market Rate (average)	Rs.18000 to 35000	Rs.8000 to 20000
Super-built area of a flat (square metres)	160 to 280	75 to 170
Floor Area Ratio (F.A.R.) achieved	1.25 to 1.75	2.35 to 3.00
Building cost (per cent)	25 to 30	35 to 45
Cost of external services excluding car park (per cent)	3 to 4	3 to 4
Car Park	For each flat	A few
Locality	In the heart of the city	Developing

When a similar analysis of the sale instances in another city is done, the figures vary. However, the qualitative difference between the flats for the High and the Middle Income Groups remain.

The standard specifications of the flats including the internal and the external services for High and Middle Income Groups, are as indicated in Annexure 8.2 and Annexure 8.3 for building and Annexure 5.3 and Annexure 5.4 for services respectively.

PRESENTATION OF DATA

After selecting the comparable sale instances, graphs have been plotted showing the chronological variation in the rates. These are shown in Figure 9.1 and Figure 9.2. All the sale instances during the period from 1/4/92 to 31/3/96 in a particular city have been considered. The rates have been shown after normalising them for the effect of the location of the flats in the building. Values with variations from the mean by more than twice the standard deviation have not been considered. The increase in the market rates of the flats includes the effects of time and the progress in the construction of the buildings and the flats. The chronological increases of each of the four components of the market rates of flats are also indicated in Figure 9.1 and Figure 9.2.

Chronological variation in market rates of H.I.G. flats in City 'A'
(Showing variation in rates of land, building, external services and promoter's profit)

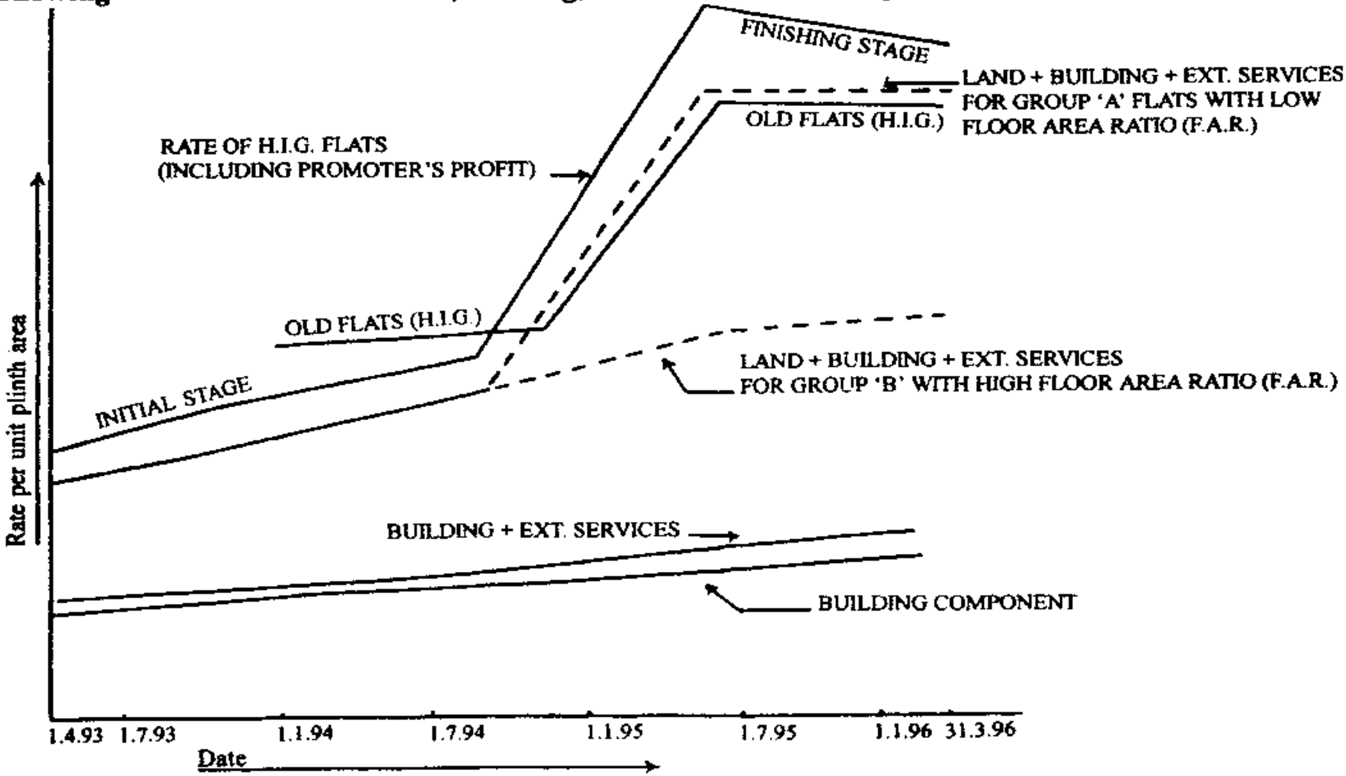

FIGURE 9.1

In the case of flats under construction, the effect of location on the difference in the rates from the average is based on the formula adopted by the developers. The variation is plus or minus two per cent from the average. The additional rate for the exclusive use of the terrace is about 8 per cent. For old flats, similar adjustments are made. No adjustment has been made due to the effect of neighbours and orientation. Sale instances indicate that there is a wide variation in the rates for each classof flats due to the effect of neighbours, position on the floor and the orientation. The effect on the market rate of flats is about plus or minus 5 per cent. The rates shown in the graph include the effect of the variation in the ratios of superbuilt area (constructed and sold) to the permissible floor area. The ratios vary from 1.20 to 1.37 in the case of Middle Income Group flats and 1.16 to 1.44 for High Income Group flats.

RESULTS

1. The results of the analysis show that the rates for the High and the Middle Income Group flats fall into two distinct time series graphs. There is no overlapping of the graphs at any stage. The difference between the average rates of the High and the Middle Income Group flats is about 80 per cent. Evidently classification of flats in a city according to income groups is appropriate. It helps to draw the right inferences from the analysis.

2a) From the dispersion of the rates of flats, it is seen that the maximum variation in the rates due to the location of the flat anywhere in a building is about plus or minus 5 per cent of the average.

2b) Developers construct the maximum super-build area of a building to maximise the income from the sale of flats. A reduction in the super-built area does not increase the market rates of flats to the extent that the total income from the sale of flats remains unaltered. In fact, the increase in the market rate is not significant. With the increase in the superbuilt area, the price of the land component is reduced. Accordingly the overall prices of the flats are also reduced. Prospective buyers are happy when this reduction in the rate is passed on to them. It compensates for the loss of value due to the overcrowding from the increased super-built area. No further reduction in the market value is noticed unless the excess is to such an extent that it is designated as unauthorised by the civic authorities.

Chronological variation in Market Rates of M.I.G. Flates in City 'A'
(Showing variation in Rates of Land, Building, External Services and Promoter's Profit)

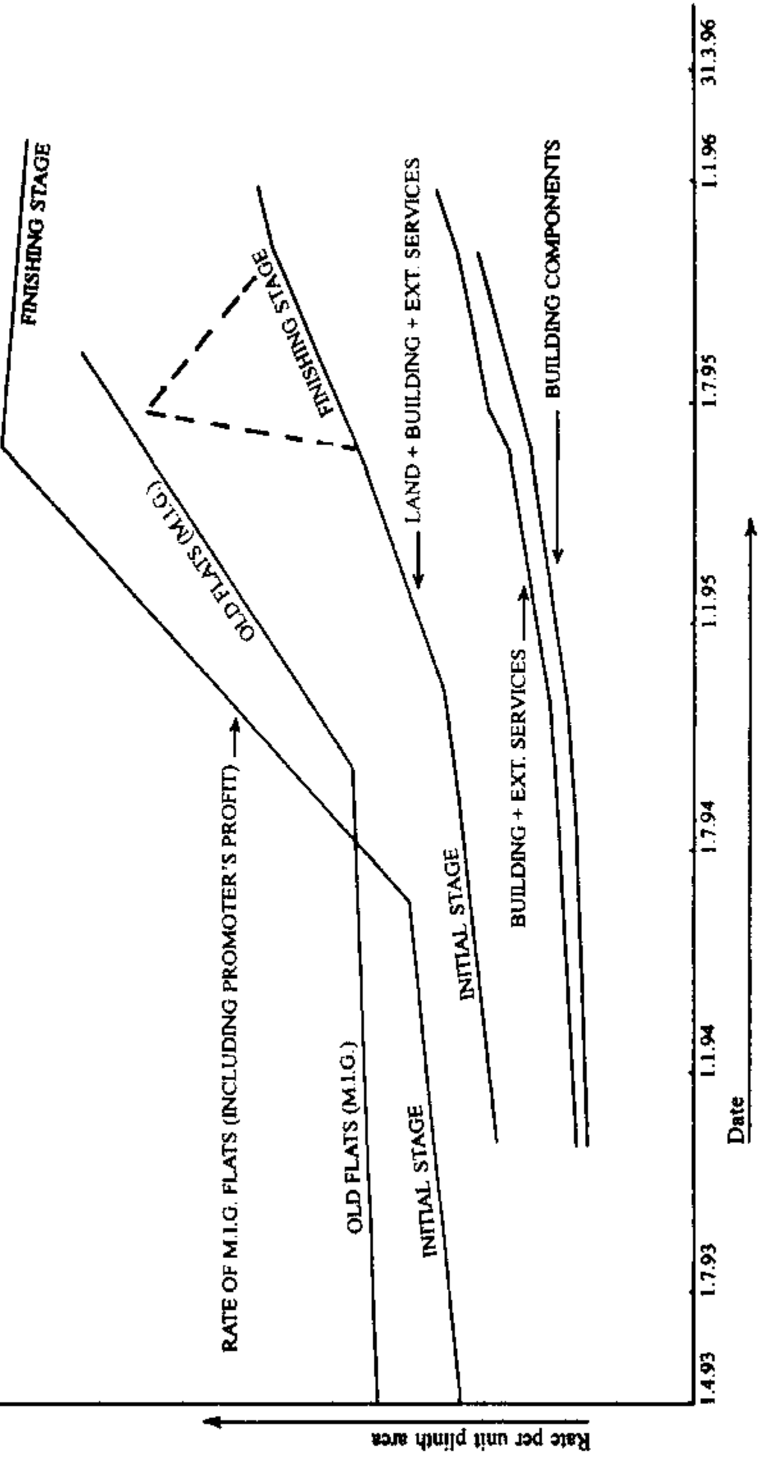

FIGURE 9.2

3. The market rates of flats is about 25 per cent less if it is purchased when the building construction is just started. This difference is after discounting the future payments at 8 per cent per annum to arrive at the present price as a lumpsum. Such early sales help to create the demand and finance the construction. In other words, on any day it would cost 25 per cent more to buy a completed flat than one at the initial stage of construction. The difference is greatly reduced as the construction proceeds. On any day, it is about 6 per cent between the market rates of flats under construction and those in the finishing stage. The reduction is due to greater demand for flats nearing completion and the reduced time for handing over possession of the flats.

   The chronological increase in the market rates of flats is due to the increase in the plinth area rate of construction and the cost of amenities with passage of time. It is also due to the chronological increase in the land rate and the increase in the promoter's profit as the construction proceeds. This is evident from the graphs showing the chronological increases in the rates of the components of the market rates of flats (Figures 9.1 and 9.2).

4. The promoter's profit varies from 5 per cent in the initial stage of construction to more than 50 per cent when the demand is very high. The average overall profit, is about 25 per cent in a stable market. Apart from the net profit it includes the overheads and extra expenses incurred in obtaining sanctions for the project.

5. The chronological increase in the cost of construction is gradual and is due to the enhancement of the cost index. It is also seen that the increase in the market rates of flats closely follows the increase in the land rates in the locality, almost to the same per cent increase. The increase in the rates of flats is invariably steeper than the increase in the cost of construction. Thus the chronological increase in the promoter's profit is very high when there is a steep rise in the land rates. Sometimes the increase is more than 100 per cent in comparison to the anticipated profit of 25 per cent in a stable market.

6. The relationship of the market rates of old flats with the market rates of flats under construction is not consistent. This is due

to the varied effects of neighbours and the element of promoter's profit in the different stages of construction.

7. Once the comparable sale instances are identified, it is easy to derive the market value of a flat from these sale instances. Suitable adjustments are made for each of the four components of value — cost of construction, amenities, land component and promoter's profit.

8. The classification of a flat does not depend on the actual floor area ratio achieved. It affects the market rate marginally because the developer provides better specifications to offset the physical disadvantage due to higher floor area ratio in the neighbourhoods near the city centres. Prospective buyers do not consider the higher floor area ratio as such a great disadvantage as to lower the classification of the flat. The additional cost of construction due to superior specifications is less than the saving achieved from the higher floor area ratio permitted in the neighbourhoods near the city centres. Thus the percentage of the promoter's profit is greatly increased as compared to that for a flat in a building with a low floor area ratio. In the latter case, the land component of the market value of the flat is predominant. The component of the land value is based on the market value of the land. There is no addition of promoter's profit since there is no additional developer's risk on this account. This is evident from Figure 9.1 for High Income Group flats. Here the average rate of flat after 1/9/96 is the same whether the land component is high or low. A similar feature is seen from Figure 9.2 for Middle Income Group flats for the period from 1/6/95 to 30/11/95.

9. Economy is the primary reason for the purchase of a Middle Income Group flat instead of an independent house. The economy due to the reduced cost of the land component is partly offset by the additional expenditure on account of the promoter's profit. Generally the promoter's profit is about 25 per cent of the market value of the flat. If the reduction of the price in the land component is not more than 25 per cent of the market value of the flat, it is not beneficial to buy a Middle Income Group flat in an outlying area. In such a case, due to the low land rate in the locality, an independent house is more economical than a flat due to the higher benefit-to-cost ratio.

LIMITATION OF THE ANALYSIS

In most Indian cities, the market for flats is still evolving. The prospective buyers are unused to the benefits and disadvantages of living in flats. They are unable to evaluate the market values of flats. The problem is worse due to the varied types of real estate development with different levels of credibility in respect of quality of construction and timely delivery of the flats.

The element of the promoter's profit is substantial and it entirely depends on the market condition. The market varies from one city to another and from time to time in the same city. The market price of a flat is decided, more on the basis of the current trend than by a logical step by step evaluation of its intrinsic worth as compared to its sale instances.

CONCLUSION

The market value of a flat cannot be accurately calculated by the development method. It is best derived from comparable sale instances of the same class of flats. The principle that the market value of a flat consists of four components — land, building, amenities and the promoter's profit, helps to analyse all the sale instances. Suitable adjustments are made for the values of each of the components. This method of analysis is applicable for analysing all the sale instances of flats in any particular city. It helps to drive the fair market value of a flat from comparable sale instances of flats of the same class in the same city. To evaluate the justified or profitable component of promoter's profit, it is necessary to understand the process of real estate development.

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PART 3

REAL ESTATE DEVLOPMENT

Chapter 10

Real Estate Development and Development Method of Valuation of Land

The owner and the developer of an urban land attempt to realise the maximum value of a land. All the possible development options are examined and evaluated. The objective is to maximise the return on the investment and minimise the risk. Evidently real estate development is a business proposition. As in any other business, the promoter's profit is the difference between the income and the investment. It is a small per cent of the huge investment. The extent greatly depends on the sale value of the developed property which, in turn, depends on demand and supply. Hence, planning a real estate development involves business decision-making.

Due to the change in the lifestyle of the middle class, the demand for flats and apartments in the cities is growing rapidly.

In the development method of valuation of land, a scheme of development is prepared to realise the highest potential value of the land. This method is appropriate for the valuation of a land with a potential for enhanced value through development. Yet, most valuers place less reliance on this method because of the large number of assumptions involved.

As in any other business, real estate development involves uncertainties and risks. Evidently the correct application of the development method requires a thorough understanding of the development process and an adequate market study. These help to make reasonable assumptions while deriving the value of a land by the development method. This method is also appropriate to determine the fair market value of the development rights to be sold and for joint development of a land by the owner and the developer.

VALUE ADDITION DUE TO DEVELOPMENT

The cost of construction of a flat is the same in all parts of a city. However, the market values of the flats greatly depend on the location. The cost of an independent land and building is prohibitive. This is the basis of the development potential of a land and the developer's profit. The value of the developed property is the sum of the market values of the flats. The value of the building component and the promoter's profit are determined in the manner outlined in Chapter 8 on Fair Market Value of a flat. If the sum of the values of the building component and the promoter's profit is deducted from the market value of the developed property, the net value is the value of land by the development method. A developer may try to pass off this value to his own efforts. But competition among real estate developers ensures that no part the enhanced value of the land due to its development potential is appropriated by the developer as the profit due to his own effort. The development process is merely a technique to release the inherent higher value of the land.

The actual profit depends on the sale value. This, in turn, depends on the actual demand and supply. However, in the valuation by the development method, the per cent profit, normally expected by the developers is considered. The demand and supply of flats do not affect significantly the cost of construction, but these greatly affect the market values of the flats. The profit is highly sensitive to the market values of the flats. The value of land is also affected, but only to the extent determined by the higher but the stabilised market values of the flats.

REAL ESTATE DEVELOPMENT

Traditionally real estate development is associated with its commercial aspect of developing an urban property for profit only. Any other approach is doomed to failure. A real estate development is a commercial business venture. It is planned, executed and evaluated purely on commercial lines. An individual developer has no control over the market. Thus the profit from the real estate business greatly depends on his business acumen to predict the sale value and the cost. It also depends on his ability to control the business to keep it within the marketing and the investment plans. Like any other business, a real estate business also operates in its own environment — internal and external. The developer has no control over the external environment and has only a limited control over the internal environment. Thus there is a considerable uncertainty in assessing the profit from a single real estate development. However, the silver line is that in a rapidly growing market (but not otherwise) there is an ever rising escalation of real estate values. It greatly offsets the risk. The plan for the real estate development process is indicated in Table 10.1.

PRE-FEASIBILITY STUDY

A feasibility study may cost about one per cent of the cost of a project. Before committing any investment for a feasibility study, a prefeasibility study is conducted by collecting all available information. These include the database of sale instances of lands and the flats in the city. The objective is to identify the localities with good opportunities for real estate development with a view to select a few prospective sites. The idea of a development project may occur to an entrepreneur from a careful study of the market, survey of the real estate business, a study of the development plans for the city and the experience of other developers. The pre- investment study may be carried out by the promoter or the investor himself. He may take the assistance of an expert consultant with an adequate database and experience of similar developments in the city.

Primarily there are two types of development of a land. The first is the development of the infrastructure to make the land suitable for sale of plots of land for houses. The second type is the construction of multistoried flats or apartments. While the former is appropriate in the outlying areas of the city, the latter is for highly developed areas near the city centres.

An opportunity study must consider the following:

1. The availability of appropriate inputs including land, finance, building materials and labour. The possibility of conversion of land use from agricultural or fallow land to housing or industrial use is also considered.

2. The present and the future demands for accommodation in the locality are forecast. These are based on the anticipated growth of population, increase in the purchasing power of the prospective

buyers, growth of the business environment interlinked with other businesses and the growth potential of the locality.

A commitment to incur the expenditure on a feasibility study depends on the outcome of the pre-feasibility study. The latter study

Table 10.1
Plan for the Property Development Business Process

Stage	Design and development	Process with local authorities	Legal Process	Financial	Marketing
Pre -investment	Identify suitable land for development	Obtain infor-mation	Associate parties to purchase land	Rough estimate of investment cost and value of land by development method	Analyse market
				Locate financier	Determine highest and best use of land
Technical feasibility	Prepare scheme for highest and best use of land	Obtain approval of layout plan		Obtain competitive concept designs and rough cost estimates	-
Economic feasibility	Prepare preliminary estimate	Obtain approval of concept scheme and model	Draw up agrement for purchase of land or its development	Prepare financial analysis and arrange financier	Market survey
Final project development plans	1. Site parti-culars and soil investi-gation	Obtain approval	1.Examine title of land	Prepare budgets and cash flow statement	Prepare marketing and promotional programme (including brochure)
	2. Submission plans		2. Make agreement for land		

covers the same features as a feasibility study but is essentially a desk job. It is not based on any field test or specific data except those obtained from the market and a mere inspection of the locality. Anticipated approximate sale values and the rough cost estimate based on the all-in plinth area rates of construction (as shown in Annexures 2.2 and 2.3) for respective types are considered. The standard rates (per square metre of the land) are considered for development of the infrastructure and the services. Alternative materials are not considered at this stage. As a result of the pre-feasibility study, a limited number of *prima facie* viable schemes are listed to study the feasibility. At this stage, cost estimates are mere guesstimates, being 'of the order of'. The variation from the actual may be of the order of plus or minus 20 per cent. The format of the pre-feasibility study is shown in Annexure 10.1. A similar but more detailed report is prepared for the feasibility study with better estimates of costs and sale values.

Market Study

A wrong investment decision on a real estate development may mean such a heavy loss as to put the company out of business. Thus the emphasis is on the market study as a prerequisite to a feasibility study. It is a part of the pre-feasibility study. The following are the two main objectives of the market study :

1) The first objective of a market study is to determine whether there is an upswing in the real estate business.

   Successful business entry is likely in the early stage of an upswing phase only. Such a phase is discerned from the leading indicators (similar to those outlined in Chapter 7, Annexure 7.4). An overview of the Indian property market with reference to the real estate business in general and the effect of the practical application of the statutes and bye-laws puts the market study in a proper perspective.

2) The second objective is to define the nature of the proposed development, identify prospective locations and forecast the likely demand for the units to be produced. For this purpose, the following informations are collected :

   a) The analysis of the economic and social trends relating to housing, work and income distribution in a city helps to identify the profitable development schemes. There is now a greater awareness about the value of time, particularly among business executives and the entrepreneurs. Since the market needs to be developed, it is usual to take up the development and the sales in several phases. This has the added advantage of limiting the scale of operations according to the resources available. The cost of idle capacity is greater when a project is executed in a single phase.

As in any other business, market and sales capability are the touchstones for the success in a real estate development project. In spite of the marketing capability of the developer, it may not be possible to sell the product, if a market does not actually exist for the particular type of development. Thus it is essential to determine the types of development for which there are considerable demands in the city and the rate of return of investment expected from these types. The market study must reveal why the actual buyers buy, what they buy The anticipated demand and supply are assessed for the next five years.

b) Identification of customer groups, their housing needs and paying capacities.

Prospective purchasers are the people with the purchasing power. Performance specifications of the units need to be defined, based on the requirements of prospective customer group. In a changing society, new groups of customers are emerging fast. One such example is the group of upwardly mobile executives of successful businesses. Another is with both spouses working. For them, time is the currency of the future. Easy access to the workplace and the multimedia for information and entertainment is important.

c) Identification of the localities suitable for the types of development appropriate for the prospective buyers.

It is necessary to identify the location where the prospective buyers would like to live. Apart from the business executives and families with both spouses working, the other market segment for the sale of flats is of pensioners. The life- expectancy has increased considerably. Old couples living alone prefer to live in flats.

d) The nature of the development appropriate for each group of customers.

The market is flooded with marginal innovations. What counts is the real product innovation. For this purpose, the value engineering approach is appropriate.

e) The prevailing price levels of developed properties and the expected internal rate of return on investment in real estate business in the city.

Each type of business has an internal rate of return. So is the case for the real estate business.

F) The nature of competition *vis-a-vis* the strengths and weaknesses of the developer's business.

The purpose is to ascertain why the prospective buyers should prefer the developer's project and what sets it apart from the competitors. The aim is to develop an image of offering something special.

g) The marketing strategy to achieve the objectives

It includes the information about pricing; the agency for selling and promotion; the problems of marketing and how to overcome them and the stagewise sales plan.

h) The sources of finance for the development project inclusive of the information about the constraints and how to overcome them.

i) The sources of input material and skilled labour.

Information about substitute materials and alternative sources for skilled labour are also noted.

k) The inhibiting factors

The high cost of credit inhibits the growth of housing. A credit squeeze is a precursor to recession in the demand for real estate and for financing the real estate development.

A market study begins with the study of the city development plan along with the Survey of India map for the city and the analysis of the sale instances. Next is the type of development appropriate. Marketers view the lifestyle groups as the market segments. Organising the information into customer groups versus customer needs helps. Economic liberalisation has increased the pace of introduction of new materials into the market. The rapid change in the economic climate has enhanced the earning capacity of groups of people, thus raising their standards of living. The development must be futuristic and the developer must ascertain the characteristics (wants, needs and habits) of the prospective customers so that he can plan what to develop, where, when and to whom it will be sold. It is essential to view the benefits that will occur to the customers from their point of view and not from that of the architect or the engineering expert. The development must be such as can effectively communicate thebenefits to the target market. It greatly ensures saleability.

Demand and Supply

A detailed analysis of the demand for real estate in the city is an essential part of the market study The growth of the demand in the past five years is ascertained to make a reasonable prediction of the future growth in the demand. The sources of the demand are analysed. The growth of the business in the city is an important source to analyse the growth of demand in the concerned localities for their proximity to the markets and the institutions. The corresponding growth in the adjacent localities is also analysed. Details about the proposed plans of the established business houses for expansion of their businesses are collected. Any shift in the nature or the location of the demand is noted.

Marketability depends on the difference between the demand and the supply. The sources of the supply of new accommodation and the extent of the existing accommodation are noted. Any development planned to augment the supply in the locality by the public or the private sector is noted. Details of the existing and the proposed development of the infrastructure are also noted. These have the potential to boost the development and the demand for real estate in the locality.

A list of the recent sales and market activity is prepared. A similar list of the planned real estate activities by other real estate developers is also prepared. The format for a market study is shown in Annexure 10.2.

Prospective customers are attracted through promises but they get really converted into customers and are held through satisfaction. Thus the reputation of a builder is kept in mind while assessing the market. These aspects need to be confirmed from the market survey.

Market Survey

Familiarity with the locality and the real estate market can generate a valuable hunch and a desk top market study may reinforce that hunch. However, the study may still lack conviction — unless the assumptions and results of forecast are verified thorough physical verification in the market survey. Otherwise, hunches can turn out to be half-truths, thus making the development project a wishful thinking. The market survey must enable a realistic prediction of the cashflow from sales. Of particular interest is the likelihood of effecting sales soon after the land is acquired, plans got approved and appropriate advertisement made. Since all the flats cannot be sold in one lot, the market survey should indicate the possibility of effecting the sales of the flats after completing the structure and the services but without finishing other flats which are yet to be sold. Sometimes, the buyers prefer to purchase the flats without the finishing so that they can get these completed according to their own individual choices. The key to successful marketing is to provide the flexibility to cater to the individual needs.

A sure recipe for disaster is to develop a land and then try to find the buyers for the same. It should be the other way round. Property dealers and brokers are privileged to the prospective buyers' thoughts as to why they prefer to buy a certain product. This is an important source of information.

In the case of directly marketed products such as flats/ apartments, direct interaction with the prospective customers is essential. The best way to determine the customers' requirements is to interview a few prospective customers and find out what they look for in making a purchase decision. People do not look for a product but a solution to their problems. By providing a solution, the developer contributes to improve the quality of life. The development must fit the need of the customer so well that it sells itself.

The market undergoes a continuous evolution due to changing technology and the customers' needs. The key is to come out with the right type of development at the right time in a rapidly growing market. The market survey should focus the attention on this aspect. The key is to discern the indicators of changes in the market. With the rising income of the working class, the expenditure on food, clothing and education tends to increase. The expenditure on housing does not increase appreciably. This is due to the prohibitive cost of acquiring an accommodation. The underlying philosophy of the working class is to rise through the class barrier through better education and lifestyle. However, a rise in the income of the high and the middle income groups tends to increase the expenditure on housing. A middle income group house is designed for comfort. For the high income group, a decent house is a symbol of achievement. The urge is to display the success in life. The house is designed as a retreat into luxury.

To decide the target market, the basic factors which determine a prospective buyer are listed. Grouping according to the location, age, level of income, business or profession, religion, ethnic origin, social class and the lifestyle helps to identify the target market group. Lifestyle determines the product requirements.

People respond to a stimulus that relates to the current felt need. A well thought out and structured questionnaire that is flexible enough to take into account the interviewee's response is of great help. Some prospective customers may need to be enlightened on better alternatives and the new features. They readily appreciate when their attention is drawn to such features in a flat already constructed in the city.

Concept Plans For Development

Planning for development is the architect's forte. Based on the prospective buyers' requirements, the space requirements for the alternative projects are ranked and the architect works out a few alternative arrangements to meet the purpose effectively. Once the final spatial arrangement is accepted by the developer, the building form can then evolve out of the purpose. The objective is to make the building appropriate and cost effective. The criteria for evaluation of alternative plans include the planning and the shape efficiencies. Planning efficiency equals the ratio of the wall to the floor. The shape efficiency is based on the optimum area of the building envelope. While semi-detached houses are about six per cent costlier than multi-storeyed load bearing construction, independent and detached houses are ten per cent costlier.

To maximise the profit, the developed value must be maximum and the cost of development minimum. Evidently, the gross developed value can be maximised if the property is developed to fully satisfy the performance requirements of the prospective buyers. An attempt to minimise the cost of construction requires a thorough understanding of the cost planning aspects. The type and size of the development project to be fixed as a part of the client's brief depends on the level of investment the developer is prepared to commit. The size is then determined, considering the all-in plinth area rate for the type of construction.

Cost Indices for Rough Cost Estimates.

The requirement at this stage (when even the sketch plans are not final) is merely for a rough cost estimate. The estimates are based on the overall index for the corresponding types of the buildings such as H.I.G. or M.I.G.(as discussed in Chapter 2 and the format shown in Annexures 2.2 and 2.3).

Anticipated Income from Sales

As a result of the market study, alternative schemes which are viable are evolved. The income from the sales is projected for each alternative taking into account demand and supply, available technology, the resource and the marketing strategy. However, reliable sales projections are possible only when the nature of development programme, price structure and promotional plans are finalised. Thus estimating sales income is an ongoing process and is a logical extension of the initial supply and demand analysis. The sale price greatly affects the volume of sales and profit. However, it is beyond the control of the developer. It is responsive to the market condition alone. To elicit market response and increase the cash flow, sales are effected in the initial stages of development at very low levels of profit. As the demand picks up and more sales are made, the developer increases the price. The programme of development should match the projection of anticipated sales. Demand forecasts are more or less subjective assessments. Thus separate estimates of future demands are made considering the optimistic and pessimistic outlooks. An important aspect of marketing strategy is the guarantee for aftersales service for a reasonable period. It may take the form of build, transfer and maintain during the extended period of maintenance till the purchasers' co-operative takes over the maintenance function (as outlined in Chapter 8).

Having shortlisted two or three prima facie feasible schemes on the basis of the pre-feasibility study, the next step is to evaluate these to select the best scheme. This is done through a feasibility study.

The boom and the recession in the real estate business closely follow such phases in the general business. It is possible to analyse the trends in real estate business. Thus it is possible to plan for a certain return on investment (ROI) and prepare a feasibility study encompassing technical and financial feasibility.

By their very nature, feasibility studies are complex and their accuracy greatly depends on the assumptions being valid. The cost-benefit analysis and the feasibility study are the tools for analysis. The success of a business and its profit can be ensured only when each and every aspect of the business is explored and the variability of each of the factors affecting it are considered.

FEASIBILITY STUDY

The objectives of a feasibility study are to define the scope of the finally selected project in the form of a client's brief for the design and make an estimate of the investment, the income and the profit. The study helps to minimise the risks of development and maximise the returns on the investment. This is achieved through a detailed analysis of the potential risks and corresponding returns in each development option. The evaluation is based on a set of pre-agreed and consistent criteria.

By their very nature, feasibility studies are complex and their accuracy greatly depends on the assumptions being valid. The promoter must outline his vision to capitalise the market opportunity. He has to conceive a rough business plan and state the objectives to be achieved by the project. It must include the plan to motivate the buyers. Evidently the developer must indicate broadly, the nature and quantum of investment that he can mobilise. The architect can assist him in the preparation of client's brief in respect of design. The planning engineer and valuer can assist both the client and the architect with his expertise in building economics and cost-benefit analysis to help in defining the type and size of development. If the land for development is not procured, he may assist in the evaluation of alternative sites for final selection by the developer. A sample form of a contract for the services of an Architect is in Appendix-3. The architect's fees vary from 2 to 5 per cent depending on the types of the services.

The results of a feasibility study help to resolve conflicting objectives advocated by experts from different disciplines. The term 'feasibility' is a misnomer. Of course, most schemes are feasible—but at what cost? A feasibility study seeks to answer this vital question by investigating all components of cost and value. A feasibility study provides the basis for a decision on project investment. It provides a detailed project report defining the exact nature of development, selected location, technology, identified resource inputs, investment and development costs, sales income and calculates a definite return on investment. In view of the crucial importance of assumptions and forecasts, these are based on the data collected from similar development projects already executed. The scope of the project is defined in preliminary drawings and the estimate together with brief specifications to be followed during construction. Cost estimates are based on plinth area rates and elemental costs from similar projects developed in the recent past. The rates are updated taking into account local conditions and the rise in cost indices. Developers usually estimate the cost of construction after collecting market rates of materials and labour and then adding an appropriate percentage of costs for company overheads. A feasibility study considers available alternatives regarding the choice of technology, location etc. The cost estimates in a feasibility study may vary from the actual by about 10 per cent.

Cost Indices for Cost Planning

Once the level of investment is indicated as the overall rough cost, the architect may develop the final sketch plans after preparing a few alternative schemes, consulting the client and evaluating the schemes. To decide the brief specifications for the proposed building, the overall rough cost is distributed among the various elements such as the walls, floor, roof, doors and windows, internal finish and external finish. The preliminary estimates of feasible alternative schemes are based on the final brief specifications, evolved after evaluation of the alternative concept plans and corresponding rough cost estimates.

A detailed estimate is based on the quantities taken from the drawings submitted to the local authority for approval. However, during actual execution, variation may occur due to the error in estimating, variation in labour productivity and the rise in market rates of materials and labour. While it is easy to determine the variation in the actual cost due to increase in rates, it is difficult to ascertain the effect of errors and variation in labour productivity on the actual cost. Cost studies indicate that there is no significant increase in the accuracy of a detailed estimate for a building (excluding items of work pertaining to services), if the number of items is increased beyond one hundred. Since labour productivity, method of construction and quality of work significantly affect the actual cost and value of a building, it is essential to provide for the same in the analysis of items of work. Even then, the estimate of cost may vary from the actual by about twenty per cent (plus or minus ten per cent) from the average. Some contractors deliberately price the items of work in the initial stage of construction higher with a view to reduce the short-term deposit required to manage the cash flow. Prices of materials depend on the source, credibility of the contractor, location of work and quantity ordered. The tendered cost depends on buoyancy in the market, availability of labour and competition among contractors (considering the quantum of work available for tendering). An individual contractor can estimate the tender price correctly within about ten per cent accuracy when compared to the actual cost.

In view of the foregoing uncertainties, it seems appropriate that for economic feasibility study, the investment costs of alternative projects are based on the preliminary estimates. The estimates are based on the plinth area rates and the cost indices worked out on the lines indicated in Chapter 5, Annexure 5.3 and Annexure 5.4 or Chapter 8, Annexure 8.2 and Annexure 8.3, as the case may be.

Technical Feasibility

Definition of the performance specifications, based on the requirements of prospective customer groups, is the first step in the study of technical feasibility. It is based on the results of the market survey. The objective of the technical feasibility study is to short list technically feasible alternatives for economic evaluation. Technology is the only process by which a land is developed. Selection of the appropriate technology is the key to minimise the cost and maximise the value addition. This is the next step. It establishes the technical design configuration, resource requirements and the selection of the site. The study covers the aspects of layout of development works, scope of the project and technology. Appropriate technology is selected after examining the available alternative technologies and relating the same to the availability of principal input materials, labour and equipment. New techniques not yet proven may cause unforeseen hold-ups. However, even in the tradition-bound construction industry, building economics needs constant review due to the rapid pace of introduction of new materials and processes. Thus the technical specifications of the development project are based on the latest developments. These are constantly reviewed in the context of acceptability in the market by the prospective buyers and their future requirements. Labour saving devices must be cost effective and improve the quality of life style. Availability of skilled labour is as important as technology. A master builder is a valuable asset to the developer. Key inputs to the technical appraisal are the following :

(i) Requirements of client, local authorities, civic bye-laws and standard codes of practice.

(ii) Preliminary field tests.

(iii) Information on the availability and quality of raw materials, labour and equipment including the reliability of assured supply and maintenance of quality.

(iv) Information about the existing infrastructure development.

(v) Environmental considerations including the treatment of water and effluents.

(vi) Inputs critical for success of the project and which need close monitoring.

Preliminary survey, investigation (including preliminary soil investigation), planning, design (including preliminary structural design) and estimating are the processes for technical feasibility study. The study helps to evaluate the alternative concept plans. Though the investigations are not detailed and exhaustive, the level of expertise required is of a high order. Expert opinion is needed to identify the specific data requirement, criteria for selection of the site, appropriate technology and sources of critical input. The architect and the engineers must inspect the site and collect the data outlined in Annexure 10.3 and Annexure 10.4. The architect avails the advice of the specialists in the planning of the structure and the services in the concept stage itself. It avoids changes required to be made even after approval of the concept by the client and the local authorities.

Architects and developers ascertain the market rates of materials, labour and the items of works. Chapter 11 indicates how to select the appropriate technology to evolve a preliminary scheme based on it.

Economic Feasibility

Before undertaking an economic feasibility study, it is necessary to outline clearly and in measurable terms, its objectives . Evidently, selecting the development project that will maximise the profit is the most important objective. The study includes investment costs, project financing, financial evaluation and selection of the final scheme. Financial evaluation of alternative schemes by comparison is possible if the project cost and sales income for each scheme are discounted to arrive at the present values. For the developer, the most important aspect of the study is the profitability analysis to determine the ratio of the net profit to capital to be invested. The analysis is based on the assumed forecasts of demand, sales income based on assumed market price and the estimate of total investment cost. In view of the uncertainty associated with each of these, it is necessary to carry out the probability and risk analysis, break even analysis and sensitivity analysis for the project finally selected. Assumptions overwhelmingly affect the results of the economic feasibility study and the conclusions drawn from it. The analysis for economic feasibility is a routine business decision-making procedure. It is the extent of the detailed study conducted to validate the assumptions (that is, the relative certainty of the prediction) that decides the quality of the study and effectiveness of the conclusions based on it. The methods used to evaluate alternative capital investments are the net present value and the internal rate of return on investment.

Net Present Value

A development project is a stream of costs and benefits. Costs are the outflows due to investment and benefits are the cash inflows from sales income from the developed property. These occur at different times. Obtaining the present values of the cashflows by discounting at the rate of interest helps to determine the net income. It also provides the basis for comparison of alternative schemes with different cash flows at different points of time. Cashflows relating to the long-term funds employed in a development project alone are considered. While calculating the rate at which cash flows are to be discounted, one may consider the effect of annual inflation for better accuracy.

The interest rates used to discount the cash flows is the cost of capital obtained from the several types of financing long-term capital investments. To account for the risk in real estate development, the cost of capital may be adjusted by adding a risk premium to it. Additional interest at about three per cent becomes payable in the case of default in payments. While considering the capital investment costs for a scheme, provision is made for all types of investments including fees of the consultants and expenses on salaried staff and other establishment. Capital cost estimates do not provide for working capital except for the margin money. Interest during the construction is not considered since it is already implied in the discounted cashflow. An element of net developer's profit is provided at 25 per cent on the capital investment, since real estate development is a risky business. Provision is made at three per cent of the anticipated approximate cost for work related site establishment (incremental overhead cost of the business) and contingencies. If land has been procured or its cost is known, it is a firm cost and hence no contingent provision is necessary on it.

A sample form for Economic Feasibility Analysis is at Annexure-10.5. It helps to assess the financial viability of each project alternative by preparing the projected balance sheets, statement of the sources and uses of funds and the cashflow statement.

Evaluation of Alternative Projects

Project alternatives, shortlisted on the basis of technical feasibility, are evaluated through financial analysis to select the best. Correct investment decision-making requires that the cash flow be discounted to account for the time value of money.

The two popular methods to compare project alternatives are the Net Present Value Ratio Method and the Internal Rate of Return Method. The former method calculates the ratio of the net present value of each project alternative to the present value of the investment. This method is adopted when the discount rate (which is based on the cost of capital) is known. In this method, the net present value is calculated as the difference between the present value of all cash inflows and outflows. In the internal rate of return method, the rate of return that would make the present value of all cash inflows equal to that of cash outflows is calculated. The internal rate of return must not be less than the acceptable rate of return on investment. After evaluating project alternatives, the one with the highest internal rate of return is selected since it can ensure the highest profit and return on investment.

The cost of capital depends on the sources of finance. In turn, it depends on several factors such as the size of investment and duration of the project. In the initial stage, when project alternatives are considered, the cost of capital may not be known. Thus it is appropriate to adopt the internal rate of return method for financial evaluation of alternatives. Once the final selection has been made, profitability can be easily ascertained by adopting the net present value method.

When the internal rate of return is calculated without taking inflation into account, it is compared with the real cost of money. If the borrowing rate of interest is 18 per cent and the inflation rate is 8 per cent, then the real cost of money is 10 (18-8) per cent.

Finance for the working capital is arranged from commercial banks or housing finance agencies as a short-term loan. Banks are averse to giving long-terms loans. The interest rate is ascertained from these agencies. The sale prices of flats, duration of the project and cost of construction are the key variables which affect the profitability of a project and consequently, the land value by the development method. For the pre-investment study, each of these variables is estimated to the best judgment of the team of experts advising the promoter/ investor. For the feasibility study, probable values (at least one value above the single value estimated and one below it) and their impact on the profitability of the project are studied.

Project proposals are reviewed at two or three levels. The subjective judgment of the experienced promoter is combined with the quantitative measures of a detailed analysis. The internal rate of return commonly expected by the experienced developers is the main criterion for an investment decision.

A low debt to equity (share capital) ratio is desirable to avoid undue interference by lenders. Thus the margin money amounting to the working capital less `trade credits' and `short-term loans' has to come from long-term sources of finance such as equity. Financial analysis is needed to arrange for a loan. It includes the profitability analysis based on the estimate of projected cash flows and preparation of projected balance sheets. The details are taken from the economic feasibility analysis.

The list of inputs required for a real estate development scheme is as follows:

1. Market survey
2. Classification of neighbourhood
3. Soil investigation
4. State of the art technology (including tools and plants)

5. Development of site
6. Database of sale instances
7. Database of market rates and availability of resources
8. Sizes of members based on preliminary structural analysis.
9. Preliminary estimate

Risk Analysis

A study of similar development projects in the past may suggest the expected net present value reasonably. It may also indicate the extent of standard deviation from this. Thus it is possible to carry out a 'what if' (often called Sensitivity Analysis) to assess the effect on the net present value if the actual sale in the first year is half of that anticipated or completion of the project is delayed by a year. The procedure to analyse the risk is as follows :

(i) Identify basic variables which significantly affect the net present value of the project. Establish the relationship.

(ii) Estimate the most probable value for each basic variable and the range of variation.

(iii) Make an informal guess of the most probable outcome,

(iv) Make an informal guess of an optimistic outcome and a pessimistic one too,

(v) Calculate the net present value for each probable outcome.

In the case of pessimistic outcome, the interest and other effects due to blocked investment resulting from inadequate sales of flats or plots needs to be considered so that distress sale is avoided.

VALUATION BY DEVELOPMENT METHOD

The development method of valuation of land is appropriate when the development envisaged is permissible as per bye-laws and similar development has taken place in a comparable locality in the city. The development method is adopted for valuation of land ripe for development. An example is of the type developed near an already developed area such as the (one) at the fringe of the municipality or corporation area and areas just outside the boundary. The other type is near civic or business centres with very high land rates.

A look at the processes involved in different phases of the planning from the Table 10.1 indicates that the final development project plans are available by the time the decision to purchase the land is made. Thus the land value by development method is worked out on the basis of final project only. However, it presupposes that the final project has been worked out after considering the alternatives as a part of the feasibility study.

The sale value is based on actual sale instances of similar flats in comparable localities. The land value obtained by development method is compared with actual sale instances of similar lands.

A suggested format for working out the land rate by development method is indicated in Annexure-10.6. It incorporates an example based on actual sale instances. Where a plot of land is suitable for development by construction of flats, its value essentially depends on the permissible floor area ratio. This in turn, depends on the saleable super-build area that can be constructed. Often, owners sell the right to develop the land by construction of flats to a developer. The developer sells the flats to make a profit. If such development of lands is common in the city, land rate can be derived on the basis of saleable floor space index from comparable sale instances with similar saleable floor space indices.

Often the land can be developed without the need to relocate the tenant or the owner. In such a case, land rate is derived from sale instances with similar permissible floor space index in the same locality. If the tenant or the owner is to be accommodated in the proposed new construction, development method of valuation is adopted (Annexure-10.7). The net saleable super-build area is determined after deducting the super-build area to be retained by the owner or given to the tenant from the total permissible area that can be super-built. This is on account of the fact that a plot of land with more area of land but less permissible floor area ratio is better compared with another land of less area but with a higher permissible floor area ratio. The former has the additional advantage of more ground area.

The estimate of land value is highly sensitive to the assumptions of the sale value of flats and the investment. Thus the method is rarely adopted as the sole method. However, it is eminently suitable to derive land rate from comparable sale instances of properties suitable for development. The reason is obvious: the same set of assumptions apply.

Land rate derived from comparable sale instances of lands suitable for real eatate development for profit

The land rate is derived from sale instances of lands by comparing their development potential. It is greatly affected by the permissible floor area ratio. The analysis is the same as in development method. This method is more appropriate to derive the land rate of a large plot of land with potential for development as group housing than from the sale instances of small plots unsuitable for such developments.

Evidently, the scheme for real estate development or the development method of valuation of land should be based on appropriate technology. This is the subject of the next chapter.

SUMMARY

Real estate development is a business process. It benefits the land owner by yielding the full development potential of the land. It also benefits the developer by giving him a profit on the development process as a business. Before committing any investment for a feasibility study, a pre-feasibility study is conducted by collecting all available information. It is essentially a desk job. The emphasis is on market study. The twin objectives of the market study are: 1) to determine whether there is an upswing in the real estate business and 2) to define the nature of proposed development, identify prospective locations and forecast the likely demand for the units to be produced. The study analyses the economic and social status relating to housing, work and income distribution in the city to indentify prospective customer groups, their housing needs and paying capacities and localities suitable for such development schemes, prevailing sale values of similarly developed units, the expected internal rate of return, nature of competition, source of finance and other inputs and inhibiting factors. It includes examination of the city development plan, the Survey of India map for the city and analysis of the sale instances. The growth of business in the city is an important source to predict the future growth in the demand. The sources of anticipated supply are ascertained. The study is supplemented by market survey to verify the assumptions in the pre-investment analysis. A few prospective customers are interviewed with a structured questionnaire that is flexible enought to take into account the interviewee's response. As a result of market study, concept plans of alternative schemes are prepared. The rough cost of each alternative is based on the overall plinth area rate and the overall cost index for the appropriate type of the building. Based on the results of market survey, the performance specifications are defined for the prospective buyer group. Technically feasible alternatives are evolved to satisfy these requirements. In economic feasibility study, each alternative is evaluated for the internal rate of return that can accrue. The scheme with the highest rate of return is selected and its net present value is calculated to determine profitability. It is unlikely that all the forecasts come out true. Thus a risk analysis is done with at least one pesssimistic and one optimistic forecast, apart from the appropriate one.

The development method of valuation of land is appropriate when the development envisaged is permissible and similar development has taken place in a comparable locality in the city. This method is adopted to derive the land rate from comparable sale instances of properties suitable for development.

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Chapter 11

Appropriate Technology for Urban Property Development And Evaluation

Value is by comparison only. Value addition and cost are the twin criteria for selection of the appropriate technology for the development of an urban property. Similar is the case for selection of the appropriate set of standard specifications for valuation of built-up property. Value Analysis is the technique for such an evaluation to select the best among several alternatives. Being function oriented, value analysis focuses attention on what the user or the customer wants. Value analysis is most productive in the formulation stage of a project for development of an urban property. It shows how the highest value addition and cost reduction can be achieved.

Lawrence D. Miles is credited with the introduction of the concept of function oriented value analysis based on deductive logic. It is interesting that out of one dozen reasons listed by him for unnecessary costs in products and processes as many as eight are due to lack of proper information about available products and processes. He rightly observed that a better and cheaper product can be procured from the market by specifying the functions to be performed by a product than by stipulating the specification of the product.

It is true that value can be quantified only by comparing it with another product or process performing the same function. Evidently in selecting the most appropriate technology, performance of the function as required by the user (or the customer) should be the sole criterion. Keeping this in mind, the main emphasis in this chapter is to provide comparative information about the state-of-art technologies. Thus the emphasis is on 'what' instead of 'how'. The former helps the architect to evolve an appropriate scheme or model of the proposed development. It helps him to prepare a preliminary estimate and helps the investor to make a decision. Knowledge about 'how' to carry out the physical process of development can easily be procured by engaging the services of engineers.

The continuous demand for improving the standards of living ensures that new technologies rapidly overtake the older ones to perform the same functions better. It puts a great demand on the skill of the investor to evaluate these new technologies and select the one which will benefit him most. It then becomes the standard for him. Similar is the problem of the valuer who must evaluate built-up properties with respect to the latest and the best proven technology. It is interesting to note that the greatest depreciation in the market value of a building occurs when a better and cheaper building comes up in its neighbourhood. Obsolescence has nothing to do with aging. It entirely depends on the introduction of new technology. Depreciation due to obsolescence cannot be assessed without the knowledge of the state-of-art technology available.

METHOD OF EVALUATION

In any evaluation, the primary concern is the ratio of worth to cost. Worth is the value of something measured by its qualities. It is expressed by comparison with another or a standard, by the degree of excellence. Lifecycle cost is the relevant cost. For evaluating alternative technologies, we are concerned with comparative qualities and the corresponding lifecycle costs. The comparison is easy if the alternative products or processes have similar qualities and economic life. Otherwise, the comparison is based on calculating the present values of the worths and the corresponding lifecycle costs. The problem is complex when alternative products perform different basic functions—only some of which are common to other products. In such a case, the market value of a product or an assembly of products, such as a building and its services, is distributed among the functions performed by it. The market value of the assembly is its true worth. The buildings are then easily compared by functions performance to cost ratios. For an example, the subfunction 'provide rest and relaxation' under the basic function 'control environment' can be produced either by a restful interior in a home, by a landscaped garden or a mutually complementing home and garden. Whichever assembly is available at the minimum cost is the worth or the market value of the alternatives. Evidently other assemblies, though costlier, are worth the same in the market.

HOW TO SELECT THE APPROPRIATE TECHNOLOGY

The most common approach is to select the alternative that requires the minimum investment and yet achieves the desired function performance at the desired level of satisfaction. Sometimes a little additional expenditure may yield a much greater level of satisfaction. Thus the incremental expenditure is worth it, on the measure of functional worth to cost ratio. The twin criteria are adequate to evaluate the alternatives.

Several components of a built-up property achieve the same function. They complement each other. Thus all alternatives may not be mutually exclusive to enable the selection of only one. Some may be contingent on the selection of a related alternative to perform some other function. In such a case, appropriate combinations are evolved. The combinations are then mutually exclusive. An example clarifies the point. For a better standard of living, one can select a better neighbourhood and a reasonably good building or develop a big plot of land with a high class building and an appropriately landscaped garden to create the appropriate micro-environment.

Each alternative selected for evaluation must be feasible for implementation. Technical feasibility aspects have been discussed in Chapter 10 and Annexure 6.1 of Chapter 6. Every alternative encounters constraints during implementation. Evaluation of the performance under the specified constraints is the norm. These aspects have also been considered in the following informations relating to the state-of-art building technologies.

APPROPRIATE TECHNOLOGY

Building (Super-structure)

For a low rise building (upto four storeys) load building construction is more economical than a framed structure. The building must conform to the provisions in the Indian Standard Code of Practice for structural use of un-reinforced masonry (IS 1905). For buildings in seismic zones-IV and V, it must also conform to the provisions in the Code of Practice for Earthquake Resistant Design and Construction of Buildings (IS 4326). Essentially, the building should be well tied.

The reinforced concrete building components are designed according to the provisions in the Code of Practice for Plain and Reinforced Concrete (IS 456). To achieve economy, the components are designed on 'ultimate load theory' or the 'limit state analysis'. Reinforced concrete framed structures are suitable for large spans (more than 4.5 metres) and tall buildings (more than four storeys).

For slabs spanning in one direction, the effective span to depth ratio is limited to 28; for two way slabs, the limit is 31. The average is 25. For beams, the span to depth ratio is 14 in seismic Zone-IV and 16 in Zones I, II and III. The sizes of interior and exterior columns are taken as 12 and 18 sq.cms respectively for every square metre of floor supported. The quantity of reinforcement in slabs is 70 kg per cubic metre. For reinforced concrete-framed structures, the average quantity of reinforcement is 120 kg per cubic metre of concrete in slabs, beams and columns.

Tall buildings (with 8 or more storeys) in Zone IV or V are designed to conform to the provisions in IS 1893, Criteria for Earthquake Resistant Design of Structures'. Additional reinforcement of about ten percent (that is 12 kg per cubic metre of concrete in slabs, beams and columns) is required to resist the additional stresses in the columns and beams in Seismic Zone-IV. For tall structures in Zone-V and very tall structures in Zone-IV, shear walls are provided to resist the horizontal forces due to earthquake.

Foundation

The objectives of the technical feasibility study for the foundation of the building is to ascertain the presumptive safe bearing capacity of the soil and decide the type of foundation.

Soil Investigation

To ascertain the presumptive safe bearing capacity of the soil, a preliminary investigation is necessary as stipulated in para 3.1.1 of IS 1892. Knowing the type of superstructure, the first step is to inspect the site and its neighbourhood and collect the information about the soil profile, type of foundation generally adopted and to guesstimate the presumptive allowable bearing pressure for the soil below the foundation. This is done through reconnaissance and simple visual and manual tests. If soil investigation details are not available for nearby sites, a test pit or a bore hole is dug to examine the soil at foundation level.

Knowledge of the regional soil deposits corresponding to the locality, the prevalent practice of subsoil investigation and foundation help to guess the type of the soil. Major regional soil deposits in India are — alluvial soils, black cotton soils, laterities, desert soils and sub-marine soils. Reference may be made to Indian Contributions to Geo-Technical Engineering published the by Indian Geo-Technical Society for sources of information on the regional deposits.

Soil grains consist of inert rock minerals (cobble, gravel, sand and silt), often combined with significant amounts of clay (say, more than 5 per cent). Inert silt grains are angular or rounded (thus contributing to greater or less angle of internal friction), particles of clay are small platelets with negative charges on both faces which attract the positively charged ends of water molecules. This bond is responsible for the cohesion (C) of clay. Silt or sand with appreciable amounts of clay (say, more than 15 per cent) behaves like clayey soil since the permeability of clay is of the order of 10^{-7} centimetres per second compared to 10 centimetres per second for sand. This capacity of the clay holds the water molecules for long — even when pressure is applied on the soil. It greatly influences the behaviour of clay in shear strength, compressibility and permeability.

Simple and quick methods of field identification of soils:

i) Fine sand is differentiated from silt by placing a spoonful of soil in a glass jar or test tube, mixing with water and shaking it to a suspension. Sand settles first, followed by silt (which take about five minutes). This test may also be used for clay which takes more than 10 minutes to start settling. The percentage of clay, silt and sand are assessed by observing the depths of the sediments.

ii) Silt is differentiated from clay as follows :

(a) Clay lumps are more difficult to crush with fingers than silt. When moistened, the soil lump surface texture is felt with the finger. If it is smooth, it is clay; if rough, it is silt.

(b) A ball of the soil is formed and shaken horizontally on the palm of the hand. If the material becomes shiny from water coming to the surface, it is silt.

(c) If a soil containing appreciable percent of clay is cut with a knife, the cut surface appears lustrous. In case of silt, the surface appears dull.

iii) Field indications for the consistency of cohesive soils are as follows:

Stiff : Cannot be moulded with the fingers.

Medium : Can be moulded by the fingers on strong pressure. Readily indented with thumb nail,

Soft : Easily moulded with the fingers.

iv) Colour of the soil indicates its origin and the condition under which it was deposited.

Sand and gravel deposits may contain lenses of silt, clay or even organic deposits. If so, the presumptive bearing capacity is reduced due to the proneness of the lenses to excessive settlement.

Based on the field identifications of the soil, the presumptive bearing capacity of the soil can be guessed by referring Table 2 of IS 1904.

The objectives of preliminary soil investigations are to draw up an appropriate programme for detailed soil investigations and to examine the sketch plans and preliminary drawings prepared by the architect from the point of suitability of the proposed structure.

Current methods of sub-soil exploration are outlined in Appedix 'A'of IS 1892 and the tests generally required are indicated in Table-3 and Appendix A of this Indian Standard Code of Practice.

The American Society of Testing Materials suggests that when more than 15 per cent of gravel or sand is present in any type of soil, the description should include `with'. For fine grained soils (with more than 50 per cent passing 75 micron sieve) `with' 'sand' or 'gravel' is written for percentages between 15 and 29 and `gravelly' or `sandy' for larger percentages.

If a soil investigation report is available, it can be examined in the light of the following :

Sands or gravels may be classified by the standard penetration tests into broad groups as follows :

Type of cohesionless soil	Number of standard penetration test blows 'N'
Loose	Less than 10
Medium Dense	10 to 30
Dense (or Compact)	More than 30

Based on undrained shear strength, clayey soils may be classified as follows :

Type of Cohesive Soil	Shearing Strength
Soft	(0.2 to 0.4 kg/sq.cm)
Medium	(0.4 to 0.75 kg/sq.cm)
Stiff	(0.75 to 1.5 kg/sq.cm)

After establishing correlation on the basis of other reliable tests, standard penetration test results have been in use for many years for relative density, angle of internal friction, undrained compressive strength, settlement and modulus of subgrade reaction. Some of these are of questionable value unless corroborated by adequate calibration data for the locality. Many were originally proposed without extensive study of the large number of variables affecting the 'N' value.

Bearing capacity of soil (based upon shear strength) and allowable bearing pressure on foundation (based on permissible settlement)

Except in the case of a local shear failure, the allowable bearing pressure on the foundation generally depends on permissible stellement than on the shear strength of the soil. However, in each case, the foundation is checked against shear failure, also. For this purpose, standard penetration test results are suitable for all soils except cohesive soils. Tri-axial tests in the laboratories on undisturbed samples and in situstatic cone tests on predominantly cohesive soils are suitable.

For a shallow foundation, the bearing capacity of the foundation based on the shear strength of the soil is determined according to the provisions in IS 6403 Code of Practice for determination of bearing capacity of shallow foundations. Depending on the characteristics of the soil below the foundation, in the zone of influence, it can be estimated whether there will be a local shear or a general shear failure in case of an overload (as shown in Table 11.1). Local shear failure occurs in a loose soil. The failure is associated with considerable settlement before the soil bulges around the foundation. General shear failure is along a curved slip plane.

The allowable bearing pressure on the foundation, based on settlement consideration is estimated according to the provisions in IS 8009, Code of Practice for Calculation of Settlements of Foundations. The permissible settlement is according to the provisions in IS 1904. The effect of ground water level with respect to the foundation level is to reduce the bearing capacity and increase the settlement. For both cases, the correction is made according to the provisions in IS 6403. To determine the bearing capacity based on shear failure, depth factor and shape factor are also considered according to IS 6403.

To determine the bearing capacity based on shear consideration according to IS 6403 and the allowable bearing pressure according to IS 8009, the weighted average of the 'N' values corrected according

Table 11.1

Soil Characteristics	Local Shear	General Shear
In the Load-settlement curve		
1. Ratio of the maximum load upto which load is proportional to settlement to the ultimate load at failure.	less than 2/3	more than 2/3
2. Void ratio	more than 0.75	less than 0.55
3. Relative Density	less than 20%	more than 70%
$\frac{e_{max}-e_{net}}{e_{max}-e_{min}} \times 100$		
4. Angle of internal friction ϕ (based on effective stress)	28^0	more than 36^0
5. Standard penetration test (N)	less tha 5	more than 30

Note : In most cases, the values are intermediate between those for local and general shear failures. In such a case of intermediate values, the bearing capacity is intermediate between that for general shear failure based on the (ϕ) value and that for the local shear failure based on the (ϕ') = $\tan^{-1}$ (2/3) $\tan \phi$. This is according to the provision in IS 6403. The bearing capacity is estimated by linear interpolation of the bearing capacities, based on f and ϕ'. Evidently, it depends on the ratio (ϕ-28)/(36-28).

to the provisions in IS 2131 is adopted. These include the effect of overburden pressure and in case of silt or fine sand, the effect of dilatancy due to water table.

The current practice is to use an average 'N' value in the zone affecting soil behaviour. For a spread footing, the effective zone extends to a depth equal to twice the width below the footing. For a square footing, the effective zone extends to a depth equal to one-and-a-half time the width (if the effective zones of adjacent footings do not overlap). In computing the average, any individual value of 'N', more than 50 per cent greater than the average is omitted.

It is undesirable to place a footing on soil with a relative density less than 0.5. In such a case, the soil should be compacted by drainage and/or preloading prior to placing footings on it.

Recent geo-technical studies indicate that prediction of consolidation settlements are satisfactory when compared with actual measurements. The predictions are better for inorganic insensitive clays than for others. The predictions require great care if 'e' versus log 'p' curve is curved throughout or the clay is highly organic. In such a case, the creep component of settlement is substantial.

If required, sttlements can be computed for various points, such as corner, centre or beneath the lightest or the heaviest parts of a building.

The differential settlement can be computed as the difference between the settlements of columns with maximum and minimum settlement. Alternatively, it may be estimated at 3/4th of the computed maximum settlement for spread footings for columns or walls.

Limiting the total settlement and the differential setllement to that permissible as per IS1986, the allowable bearing pressure on the foundation soil is recommended for various sizes of footings, based on equal settlement consideration.

Applying the empirical rules, or computing settlements of the structure at various points based on the assumption of a flexible foundation, it is sometimes seen that the total and differential settlements exceed safe limits for spread and strip footings. Further, the structure itself does not have sufficient rigidity (that is, unlike a well tied building with adequate cross walls and reinforced concrete bands at intermediate levels) to prevent excessive differential movement with ordinary spread foundations. In such a case, provision of a rigid raft foundation either with a thick slab or with deep beams in both directions may be considered.

The critical factor for framed buildings is the relative rotation (or angular distortion). However, the ratio of deflection to length is critical for load bearing walls.

Spread Footings

Being most economical, spread footings for a building is the first choice. For unreinforced spread footings, IS1080 limits the angle of spread from the wall base to the outer edge of the foundation to 1/2 horizontal to 1 vertical. However, the current practice is to provide a quarter brick (2-1/2" to 2-1/4") projection in each course of brick (3"), particularly for foundations on silt or clay or their combinations. The details are shown in Figure 11.1. Since the allowable bearing pressures on such foundations is less than 15 tonnes per square metre, the deviation from the codal provisions is not dangerous; otherwise, the codal provisions apply.

Isolated and Combined Foottings

It is desirable and economical to design the reinforced concrete footings based on elastic theory. It requires less reinfocement but more concrete. The footing is massive, but economical. It behaves better than the one designed by ultimate load theory. The minimum thickness of 20 centimetres at the edge of a footing is required to accommodate the hooked reinforcements in both directions and provide adequate cover. The top slope is limited to 1:3 (vertical to horizontal) to avoid shuttering for the top surface. Incidentally it helps to fix the preliminary sizes of footings. The minimum reinforcement is about 20 kilograms per cubic metre of concrete and the average is about 25 kilograms.

In view of excessive cost of a raft foundation, adequate soil investigations must be done and the report should clearly bring out by proper analysis of results that it is not possible to provide isolated footings or combined footings. Even if more than 50 per cent of the area within the periphery of a building is covered by isolated footings, it is economical to excavate the entire area below the building and provide isolated or combined footings. Sometimes the footings may even touch each other. If the soil in the narrow gap between adjacent footings is likely to get disturbed during construction, it is covered with a lean concrete spacer pad. Incidentally, it saves the cost of shuttering for the edges of the footings.

Raft Foundations

On settlement and differential settlement considerations, raft foundations are generally provided where isolated, combined or strip footings can not be provided. The conditions are as follows :

(a) A raft foundation is appropriate in locations where the soil has a low allowable bearing pressure for isolated footings. In such a case, the column loads cannot be supported on individual or combined footings without causing excessive differential settlement due to difference in column loads of adjacent closely spaced columns. Differential settlements occur due to a large variation in the sizes of adjacent footings even though these are designed for equal settlement. The capacity of any part of the super structure to withstand differential settlement depends on the characteristics of the elements comprising the same. Sizes of beams and columns and conditions of fixity are some of these characteristics.

Due to continuity of the raft over several columns, less differential settlement occurs than if the columns are resting on isolated footings. Hence, on settlement considerations, allowable bearing pressure on a raft is much greater than that for isolated footing according to provisions in IS1904.

(b) When isolated footings are close to each other, the zones of stress distribution overlap. The effect of adjacent footings is negligible if the angle of shearing resistance is low. It is substantial for a soil with very high angle of shearing resistance. The enhanced settlement of clayey soils from the effect of adjacent footings is considered. A raft foundation on a cohesive soil is provided when the soil possesses a low allowable bearing pressure and the column loads are widely varying and yet so large that more than 75 per cent of the area within the periphery of the building would otherwise be covered by isolated or combined footings. In case of cohesionless soils, though the stresses from adjacent footings significantly overlap, much of the settlement occurs immediately. Thus a raft may be provided when more than 75 per cent of the area would otherwise be covered by isolated or combined footings of columns with widely varying loads.

Masonary Spread Footings

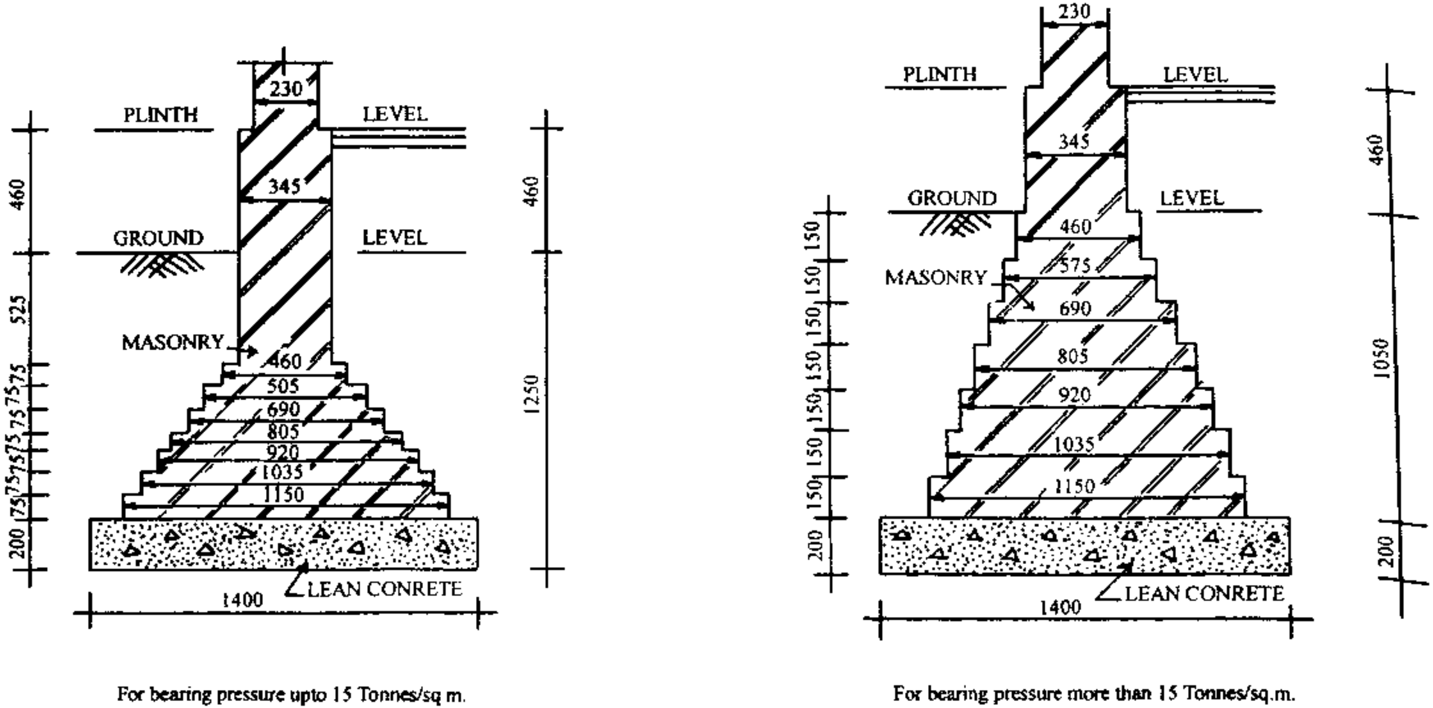

FIGURE 11.1

Even if the column loads are not widely varying, a raft foundation is provided when nearly 100 per cent of the area would otherwise be covered by isolated or combined footings.

(c) Where the soil below the foundation contains compressible lenses (thin layers of clayey soils) it may lead to appreciable differential settlement of isolated footings. It is difficult to ascertain and accommodate such settlements in the design of the structure. In such a case, grid (grid of strip footings with columns at points of intersection) or a raft foundation is provided.

(d) Where a floating type of foundation is required, a raft with basement is the ideal solution. Such a foundation is required where the building is to be founded at a deeper level in order to get a higher allowable bearing pressure through replacement of soil.

(e) Where buildings have deep basements subject to ground water conditions and heavy water-proofing is required, a raft is appropriate. The raft is more amenable to external tanking system of water-proofing.

(f) Sometimes individual footings are subject to large bending moments at the column bases. These may result in differential rotations and differential settlements of individual footings. They impose high additional moments and shear on the superstructure. In such a case, footings are tied with foundation grade beams in both directions. Alternatively a raft is appropriate.

Pile Foundation

A pile foundation is recommended only when a raft foundation cannot be recommended due to excessive settlement (which must be calculated from consolidation test) when the shallow foundation is on a loose filled up soil or is underlain by a highly compressible soil stratum. The base level of the pile is determined considering the end resistance of the stratum and settlement behaviour of the soil under the pile groups.

SERVICES

Road and Storm Water drains

1. Minimum width of public approach road to a group housing complex is 12 metres. The minimum width of a road is 15 feet

(4.5 metres). The minimum width of carriageway is 8 feet (2.4 metres).

2. Made up ground level of house sites and the formation levels of roads must permit drainage of the entire area through storm water drains upto the proposed outfall. In a place like Delhi, the run off from one acre of land equals one cubic foot per second (cusec). The minimum slope of a storm water drain is 1 in 200 for rectangular drains and 1 in 500 for circular drains for a self cleaning velocity of flow (with free board).

3. The provisions must conform to the Code of Practice for building drainange, IS1742.

4. Due to the high cost of urban land, it is more economical to provide covered drains. The minimum bottom width of a street drain is 9 inches (22.5 cms) and the minimum depth 12 inches for the minimum depth of flow (for designed discharge) 6 inches. For rectangular sections the minimum width is 9 inches for depths upto 60 cms and 15 inches for depths upto 90 centimetres. For greater depths, trapizoidal sections with side slopes of 1 horizontal to 2 vertical are provided. The high flood level and the invert level of the intercepting drains should be lower than the high flood level and invert level respectively of the drains which fall into it.

Buried non-pressure reinforced concrete pipes are provided in areas subject to vehicular traffic. The minimum diameter of the storm water pipe is 100 mm for the building and 150 mm, for the street side drain. If the invert level of the pipe is less than 80 centimetres from the road level, concrete encasement is necessary. Alternatively it may be more economical to provide an open drain at road level with a reinforced concrete cover.

Water Supply

Sufficient water at adequate pressure should be made available to each household. For equitable pressure over large areas, the overhead tank should be near the centre of the consumption. To reduce the cost, the ground level at the site of overhead tank should be high enough. While the designed life of water treatment works, machines and tube well is 15 years, the life for the other civil works for water supply is 30 years. The National Buildings Code requires the water supply to be at least 135 litres and 45 litres per person per day for residences and offices respectively. The minimum residual pressure head at the ferrule point is to be 7 metres, 12 metres and 17 metres for single, double and three storeyed buildings respectively. The physical, chemical and bacteriological standards for drinking water are discussed below.

Quality of water

It is not the total quantity of the dissolved solids that matters but what chemicals it contains. In some arid and semi-arid regions, water containing upto 4000 milligrams of dissolved solids is used for drinking without any permanent adverse effect, though the water is not palatable. It may thus be tolerated upto 3000 mg per litre of water. Chlorides impart a salty taste to water. At concentrations above 200 mg per litre it is harmful for persons suffering from cardiac or kidney ailments. It is easily felt at concentrations above 600 mg per litre. The higher limit of 1000 milligrams per litre of water is tolerated in arid regions to replenish excessive loss of salt through perspiration. Excessive chloride is corrosive.

Excessive sulphates are sometimes present in under ground water. At concentrations above 400 mg per litre of water, it has a laxative effect on new users but not on those habituated to it. In some countries, the upper limit is tolerated upto 600 mg per litre of water.

If the water contains more than 100 mg of nitrate or 2 mg of iron per litre of water, it can cause gastrointestinal diseases. Infants are affected if the quantities are 45 mg and one milligram per litre of water respectively.

Excess of fluorides beyond one milligram per litre of water causes dental fluorosis (mottling) in children. If the fluoride content is more than 1.5 mgs per litre of water, it may cause osteo-deformities.

If presence of toxic materials and bacteria are suspected, the water is tested and compared with the provisions in the Indian Standard.

Tube-well

Often deep tube-wells are provided for drinking water supply. The locations of underground aquifer and the optimum distance between tube- wells are decided by collecting the details from deep tube-wells in the locality, hydrological maps and consulting the hydrological experts such as from the Central Ground Water Board. Often the tube-well water is required to be treated for removal of excessive dissolved solids, minerals, carbon dioxide, fluoride, etc. The Manual on Water Supply and Treatment published by Central Public Health and Environmental Engineering Organisation (CPHEEO) outlines the designs for water treatment plants, even for small communities. If the water from the tube-well is brackish with excessive dissolved solids (more than 500 mg per litre), demineralisation through ion-exchange process is required. For this purpose, manufactured package units are available. These equipments are hydrologically similar in performance to rapid sand pressure filters. Chemical treatment merely converts calcium and magnesium salts into sodium salts. Hence, it does not reduce the content of dissolved solids. The process is not suitable to convert brackish water into a potable one. If other treatments are required, an integrated treatment plant is designed. If the dissolved solids are more than 4000 mg per litre, a process of osmosis combined with electrolysis is adopted. It is known as electro-dialysis. If the water is as saline as sea water with total dissolved solids of more than 10,000 ppm desalination through reverse osmosis process is required to use it for drinking purposes. The process is very costly and is adopted if the alternative source of water is so far that it becomes more costly to transport the drinking water.

Water Storage Tanks

Water is required to be stored to meet at least a day's requirement. Of this, the requirement of water for at least eight hours (peak demand) is stored in overhead tanks. It is to ensure that even if the water pump is not in operation for hours, the water supply is not affected. The quantity should be adequate to cover at least half-a-day's requirement of water. In case of temporary breakdown of the supply, the pump can be repaired or replaced within eight hours. The balance quantity of water is stored in under ground tanks.

The minimum height to the bottom of an overhead tank is the sum of the following :

a. A minimum pressure head of 3 metres at the point of supply in the tank over the terrace.

b. Height of the top of the water storage tank on the terrace measured from ground level of the overhead tank.

c. Loss of head of water from the overhead tank upto the building at the rate of 1 metre for every 250 metres length plus about 2 metres for the loss in the rising main from the bottom of the building to the outfall into the tank on the terrace.

Pumps

The capacity of the pump should be such as to fill the overhead tank at the most in eight hours. The pressure head should be sufficient to lift the water from the bottom of the underground tank to the top of the overhead tank. Apart from the static head due to the difference in the levels, a pressure head of at least three metres at the point of delivery into the tank and a loss of head due to friction in the rising main into the overhead tank are included.

Protection from Fire

In case of fire, the first requirement is to raise the alarm. The next is to put out the fire at its inception itself. Thus the best way to fight the fire is a reliable system to raise the alarm and a system for immediate delivery of fire extinguishing substance. A manually operated electric fire alarm system for the building and a portable fire extinguisher on each floor are essential and yet inexpensive provisions. Sometimes the fire is not noticed at its inception, but after it has caught fire to a considerable fire load (inflammable articles). Then the most reliable fire fighting equipment is the availability of adequate quantity of water at the place of fire and at the required pressure. For a building upto 15 metres in height, all that is required is an exclusive storage of 50,000 litres of water for fire fighting and a wet riser. The pump used for water supply can also be used for fire fighting. On economic considerations and for easy access, the water is stored in an underground tank. It is preferable to store 20,000 litres of water in an overhead tank with a delivery pipe for access at each floor level for use in case of fire only. Often the bye-laws do not require such an exclusive overhead tank for fire fighting. In such a case, the overhead tanks may be connected to the wet riser for use in case of fire. With a view to keep the water in circulation and yet available for fire fighting only, the storage tank is made as shown in Figure 11.2 for a building more than 15 metres high, at least two staircases are needed. The storage of water is increased to at least one lakh litres with at least 20,000 litres provided at the terrace level. A wet riser is also provided with access at every floor. The system is better when provided with a manually operated electric alarm.

Underground Tank for Storage of Water for Drinking and Fire Fighting

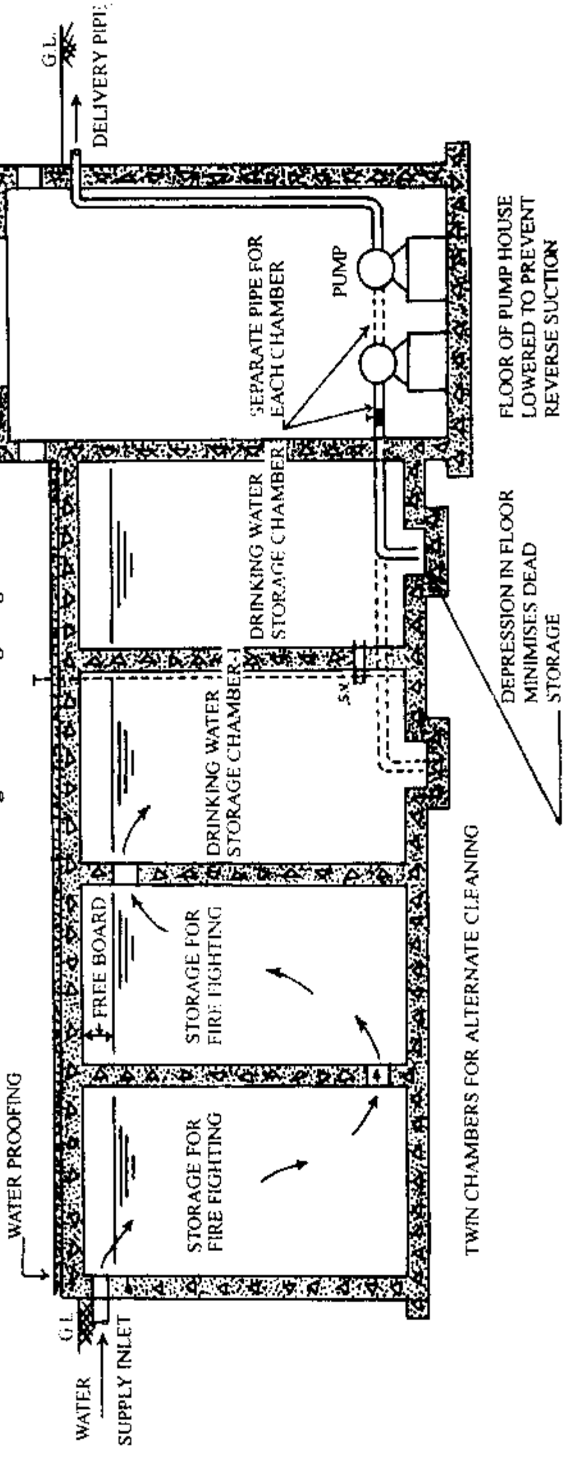

FIGURE 11.2

In a building complex, it is necessary that roads are provided all around the building. It allows fire tender to access all parts of the building. There should be adequate space at the bends in the road for the fire tender to manuovre.

Sewerage and Sewage Disposal

With greater awareness about environmental pollution, real estate development needs to lay special emphasis on sewerage and sewage disposal.

Sewage treatment

Sewage treatment, is necessary if the outfall sewer cannot be connected to the city sewerage. Planning begins from the final disposal point going backwards upto the collection points in individual buildings. The probable peak discharge from buildings is about 2 litres per minute per person for the design of sewers and sewage treatment. The project is designed to meet the requirements for 30 years. For small projects, standard design and drawings are adopted. After completion of sewage treatment, the affluent must conform to the provisions in the Water (Prohibition and Control of Pollution) Act and the Environment (Protection) Act. Septic Tanks (IS 2470 Part-I) for primary treatment and a double chambered upflow Anerobic Filter (IS 2470-Part-II) for secondary treatment are suitable for a population on 50 to 300 persons. For a larger population upto 600 persons, two septic tanks are provided in parallel. With a liquid depth of one metre, the surface area of the septic tank is about 0.20 sq.metre per person. With an average depth of 0.50 metre, the surface area of the Upflow Anerobic Filter is also 0.20 sq.metre per person (for a population of more than 50 persons).

For a sewage treatment at a single location for a population of more than 600 persons but upto 900 persons, three septic tanks may be provided in parallel. For sewage treatment at a single location for a population of more than 1000 persons capacity an extended aeration system with surface aeration or with diffused aeration is provided with two aerated tanks. It is followed by a settling tank. The peak hourly flow of sewage is three times the average. The area of land required for extended aeration process is 0.20 sq.metre per person. The minimum diameter of a tank is 3 metres. The comparisons are based on the total cost of the sewage treatment including the value of land. The present value of the probable maintenance costs are considered. In addition, the problems of methane gas from septic tank, foul smell aerosol of surface aeration and clogging of air diffusers due to dust, smoke in air and deposition outside due to low pressure are considered. If the land value is low and the neighbourhood of the treatment plant can be left vacant, surface aeration is economical and easy to maintain.

With an overflow rate of 8 cubic metres per square metre per day, the area of the secondary settling tank (excluding the area of aeration tank) is 0.02 sq metre per person. For the settling tank following diffused aeration, the area is 0.01 sq metre per person.

The upflow anerobic filter is a submerged filter filled with 20 mm sized coarse aggregates. The effluent from the sceptic tank is introduced from the bottom. The capacity of the submerged filter should be 0.04 to 0.5 cubic metre per person or one third to one half of the liquid capacity of the sceptic tank. The loss of head in the filter is 10 to 15 centimetres. Biological Oxygen Demand removal is 70 per cent. The effluent is clear and free from odour. Sewage digestion in the sceptic tank is effective if the temperature is above 18°C. The reaction doubles for every 10°C rise in temperature. The minimum sludge retention time is about 100 days.

In a cold region with ambient temperature below 15°C for months, any process based on anerobic reaction such as in a sceptic tank and an upflow anerobic filter is only marginally effective. In a cold region, a package waste water treatment based on the extended aeration process is suitable.

If the value of land is high and air can be supplied with dust less than 2 ppm (even by air filters), diffused aeration is economical and preferable. With one day detention at average flow and a liquid depth of 3.5 metres, the surface area of diffused aeration tank is 0.05 sq.metre per person. In the extended aeration of the batch reactor type, the screened sewage is aerated in the first aerator and then allowed to settle by switching off the air blowers. Then further incoming raw sewage is led to the second aerator. The process is repeated. Part of the settled bio-mass is used to treat the next batch of sewage. The excess sludge is disposed off. If needed, the sludge is thickened by passing through a filter press.

If the atmosphere has high dust and smoke, it may not be possible to supply air with dust less than 2 ppm (even with air filters). In the extended aeration of the continuous flow type, the screened sewage is aerated in the contact zone. It then flows into the settling tank. The settled bio-mass is pumped back into the stabilisation zone and oxidised by diffused aeration. Part of the stabilised bio-mass is taken to the contact zone and the excess sludge is taken to the digestion zone and aerated. The digested inert solids are separated by passing the sludge through a filter.

The clarified water from the settling tank is treated with an environment friendly chemical dosage, and led to the outfall surface drain.

Sewerage

A sewerage system is designed to permit the flow by gravity into the outfall sewer. The available energy is utilised to maintain the appropriate velocities of flow with minimum loss ofhead in each sewer. The objective is to maintain appropriate velocities of flow in the sewers. The sewerage is designed to maintain the self-cleansing velocity at the present peak flow and to run at four-fifths full at the ultimate peak flow. In the case of a small bore sewerage system, the present peak flow is three times the average flow and the ultimate peak flow is twice the present peak flow. The sewer is designed to flow full at this ultimate peak flow. A minimum depth of 0.4 metres soil cover is provided. In case of vehicular traffic, the invert should not be laid at a depth of less than 0.8 metres. Otherwise, concrete encasement is needed. The minimum size of a sewer for house drainage is 150 mm and that of a street sewer 250 mm. The minimum slopes to facilitate minimum velocity flow of one metre per second by gravity to avoid sewage pumping or deposition in the line are indicated in Table 11.2. The maximum slope to limit the velocity to three metres per second are also indicated in Table 11.2. The maximum slope is limited to avoid sewage decomposition. This is achieved by providing man-holes with sewage drops.

The quantity of sewage equals the quantity of filtered water supply. The sizes of water supply and sewerage pipes are designed on the basis of fixture units of water supplied to the fixtures and the probable demand from several fixtures likely to be used simultaneously.

Electrical Installations

Sub-station

It should be located near the centre of the electrical load (consumption). Since the electrical load from air-conditioning plant room is very much, it is preferable if the electrical sub-station is near the air-conditioning plant room. It helps to control the switches.

Generator

Its capacity must ensure adequate supply to essential lighting and equipments. For middle income group housing it may include lighting the passages. For high income group, it may include lighting, one lift and pump for fire fighting. The generator is housed in the electrical sub-station for better control.

Table 11.2
Minimum and Maximum Slopes of Sewerage Lines.

For house sewerage with stoneware pipes (diameter in mm)	Minimum slope	Maximum slope
150 mm diametre	1 in 60	—
225 mm diametre	1 in 120	—
For street sewers		
150	1 in 200	1 in 100
200	1 in 200	1 in 100
250	1 in 200	1 in 150
300	1 in 250	1 in 200
350	1 in 300	1 in 250
400	1 in 350	1 in 300
For Main Sewers		
450	1 in 500	1 in 350
500	1 in 600	1 in 450
600	1 in 750	1 in 500

Electrical System

The system must conform to Indian Electricity Rules 1956 as amended from time to time.

The voltage at any point should not vary by more than 6 per cent. However, the system and the equipments are designed to withstand a variation of about 10 per cent. Earthing is designed to ensure that on occurrence of the fault of negligible impedance (from a live wire or non-earthed conductor to the adjacent exposed metal), an electric current not less than three-and-a-half times the rating of the fuse or one-and-a-half times the setting of the Earth Load Circuit Breaker will flow and break the continuity of the faulty circuit. The size of the earth continuity conductor is not less than 1.5 sq mm for copper wire and 2.5 sq mm for aluminium wire nor less than half the size of the largest current carrying conductor. Adequate power factor (0.85 or more) ensures energy efficiency. If the load is more than 1 KW, the circuit is controlled by a miniature circuit breaker (MCB) preferably or at least by an isolator switch. Pipe of rod electrodes only are provided as earth electrodes.

The layout of the electric supply to the premises through overhead lines or underground ducts must avoid possible interference with existing or future substructures and services. It should ensure adequate horizontal and vertical clearances.

Fire alarm system

Buildings with height more than 15 metres are provided with manually operated Electric Fire Alarm Systems. An Automatic Fire Alarm System is required if the height is more than 24 metres.

The wiring and equipments for a fire alarm system must be independent and be away from any other electrical system (at least by 5 centimetres).

Secondary supply of electricity from a battery (continuously trickle float charged from A.C. mains with facility for automatic recharging in 8 hours) is provided. Not more than 200 detectors can be connected to a single circuit.

RECREATIONAL AMENITIES

Community Hall

A community hall is generally for multi-purpose uses with no fixed furniture or sitting. It can be used for stage performances, as a marriage hall, club house, for indoor sports or social get-to-gather. Flexibility of use is specified for design. However, for a multi-purpose hall with fixed sitting arrangements, the stepped tiers may form a parabolic profile (to provide an uninterrupted sight line with each step height of 100 mm to give an approximate slope of 1 in 12) and with the number of rows limited to twelve. Seat width is 500 mm, with arms. For seat length of about 550 mm., the seat spacing along the length of the hall is about one metre. Minimum is 750 mm. The net seating area is about one sq.m. per seat. Seating area is generally 50 per cent of the total area of the hall. Maximum width of aisle is 1.1 m. The minimum level of illumination is 400 lux. Provision for emergency lighting is 5 lux. The structure is rated for three-fourths of an hour fire proof. For use of the hall for eating out (on table) the space requirement is about 2 sq. m. per person. Typical lobby area adjacent to the main hall is about one-third of the area of the main hall.

Sports/Play ground

One-and-a-half to two acres of land with good draining soil and a top slope of at least 1 in 80 is required for outdoor sports and children's playground.

Swimming Pool

The length of a swimming pool for adults is about 17 to 20 metres and the width in multiples of 2 metres (for each lane). The minimum width is 8.5 metres (four lanes). The area of surrounding space including the pool side store and first aid is equal to that of the pool. The pool depth is 900 mm at the shallow end and varies from 1.8 metres to 3 metres at the other end.

CONCLUSION

Adoption of appropriate technology ensures that the cost of the urban property development project is minimum. It also avoids costly time overruns. Adoption of building specifications matching the performance requirements as outlined in Chapter 6 on Building specifications based on Value Engineering ensures that the proposed development has the maximum market value. The two together ensure that the twin objectives of development of an urban property are fully achieved. Evidently any existing urban property is also required to be evaluated with reference to these very twin criteria. The lowest cost equals the functional worth. A prudent buyer pays as much as a property is worth. Thus appropriate technology and technical specification based on performance requirements are the standards against which the fair market value of an urban property is determined.

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Epilogue

Climatic design of a building and according to the client's requirements requires a complex analysis of voluminous data on climate and available technology. Manual planning and 'drawing is very difficult and performance evaluation of a design is rarely done. Computer aided analysis and design does the job in a jiffy and at the same time gives the capability to the architect to answer the client's million dollar question, 'what if...'.

Too many factors affect the market value of a urban property and the analysis is complex. An individual valuer may have information about a few sales only. However, the valuation process is similar. Computer based solutions are ideal.

A knowledge based system is being developed by the Author for application by architects, engineers and valuers. Readers who are keen to have the software to design, draw and evaluate the development of an urban property or determine the fair market value of a property (existing or proposed) may contact the Author.

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ANNEXURES

ANNEXURE 1.1

ESSENTIAL FEATURES OF AN AGREEMENT TO SELL AN IMMOVABLE PROPERTY

An agreement which is binding and legally enforceable is a contract between the parties to the contract. It contains promises of the parties to do certain acts. Thus it creates obligations on the parties which they must fulfil. When the terms and conditions of a contract are written, signed, sealed and delivered, it is known as a deed. A deed meant for transfer of an immovable property by conveying the title and handing over possession is known as a deed of conveyance. A deed of execution is one that has been completely performed or it is to be executed in future.

A contract to sell an immovable property must be valid. An agreement enforceable by law is valid. The Indian Contract Act specifies that all agreements are contracts if they are made by the free consent of the parties competent to contract with a lawful consideration for a lawful object and are not expressly prohibited by any law.

The following are the essential features of a Valid Contract :

1. An agreement,
2. Competent parties to the agreement
3. A lawful object
4. Consideration for the object
5. Free consent of the parties to the agreement.

An agreement is when one party makes a proposal in the form of a promise and the second party to whom the proposal is offered or the promise is made, accepts it. Thus there must be at least, two parties to an agreement. In the case of an agreement for the transfer of a property, the holder of the title and possession is referred as the vendor and the party receiving the title and possession is often referred as the vendee. The proposal, in the form of a promise made in the agreement, creates a duty on the part of the one who makes the promise and automatically creates a right and bestows it on the other party. The promises form the consideration for each other.

Every person who has attained the age of majority (according to the law to which he is subject), is of sound mind and is not specifically disqualified from contracting by any law (to which he is subject) is competent to contract.

A lawful object or consideration is one which is not forbidden by law, is not fraudulent, does not imply injury to the person or property of another and the courts do not regard it as immoral or opposed to public policy. A good consideration means one, either not measurable in money's worth or if measurable, is not transferred. An example of the former type is natural love and affection. An example of the latter type is release from a debt.

A valuable consideration means one that is measurable in money terms or money's worth. Appurtenances means all rights appurtenant (that is, pertaining) to the land that go with the land; though these may not be within the area covered in the description. An example of such rights is the right to access to the public roads adjacent to the property.

If the description of a property is such that it is not possible to be definite about it, so as to identify it uniquely among many others related to it, the deed is void on account of uncertainty.

Free from encumbrance means — to the best of knowledge of the transferor — he has full ownership title. It enjoins on him to specify any encumbrance on the property, if he is aware of it. All restrictive covenants mentioned in the report or revealed from the inspection of the property need to be examined carefully, as to their impact on the value of the property. The nature of the title is within the exclusive knowledge of the owner and he is bound to tell all the truth relevant to the matter at hand. The seller is bound to disclose latent defects, of which he is aware. A latent defect is one which cannot be discovered by the buyer with ordinary care. In the absence of words to the contrary, the presumption is that the title is free from encumbrance and reasonable doubt. A title free from reasonable doubt is marketable.

Consent is evidenced through voluntary acceptance of the promises together with the implied obligations. Affirmation by signing the agreement (preferably in the presence of witnesses) is the evidence of consent. Consent is said to be free when it is not caused by coercion , undue influence, fraud, misrepresentation by one party or through mistake of both the parties as to a matter of fact essential to the agreement.

Keeping in view the provisions in the Indian Contract Act and the Transfer of Property Act, the essential features of an agreement to sell an immovable property may be divided into the following groups :

1. Date.
2. Identification of parties to the sale or transfer.
3. Statement of the parties regarding title and possession.
4. Description of the property to be sold or transferred.
5. Consideration, terms and conditions of payments.
6. Transfer and conveyance.
7. Other terms and conditions, including restrictive convenants.
8. Witness.

ANNEXURE 1.2

Form of a Sale Deed

A transfer of an immovable property takes the following form :

Sl. No.	Salient features	Details as per sample deed
01.	Deed of sale and date of contract	THIS DEED OF SALE executed on this (day) of (month) One thousand nine hundred and........
02.	Parties to the deed	
i)	The vendor/vendors	By (1) Mr/Mrs.......aged.....yrs, households affairs, wife and
ii)	Is seller a citizen, of eligible age and competent ?	(2) Mr..., aged....yrs, student,son of...........
iii)	Person interested in the property (e.g. confirming party), other than vendor and vendee	
iv)	The vendee/vendees (transferee/transferees)	IN FAVOUR OF..........a company incorporated under the provisions of the Company Act having its office at.........here-in represented by one of its directors (HEREINAFTER CALLED THE "PURCHASER")
3.	Statement of the parties	
i)	Affidavit of title by the vendor. Reference to the parent deed (to be handed over to the vendee). Authority to execute the deed if the vendor	WHEREAS all those pieces or parcels of land together with the building having an extent of.........in survey no.........part of .... more specifically described in the schedule hereunder was obtained by.............S/o............. (husband of the Vendor No.............) and as per sale deed executed in his favour by .... residing at...........and registered as

	is acting through an agent.	.......No.......of book... Pages...(to)........of Sub-Registry office, AND WHEREAS THE SAID............. S/o,........... who was residing at.......... ....expired on....... and the vendors are legal heirs to the said succeeded to the state of the deceased according to the Indian Succession Act. After the death of Mr...............all rights have been vested with the vendors in the unencumbered andundisputed possession. The vendors have obtained Legal Heirship from Thasildar ....The vendors of the scheduled properties,
ii)	Status of possession and occupancy (tenancy, encroachment litigation)	been in full enjoyment thereof and held by right, having paid the taxes due,
iii)	Reason for sale transfer (optional)	AND WHEREAS the vendors are permanently residing at.......... ...and have felt that retaining the scheduled property is not viable and not profitable for them and
iv)	Intention to sell	for that reason have decided to sell and dispose off the property and
v)	Acceptance of offer	the purchaser has offered to purchase the same, which offer the vendors have fully accepted.
vi)	Agreement to sell – promise	AND WHEREAS THE vendors have agreed to transfer to the purchaser by way of sale
4	Description of property (object of consideration)	
i)	All means every part of the property including	All the rights, title, interest, estate and possession in the schedule landed properties and

	the land and all the development on it.	
ii)	These expressions remove any doubts as to	all the improvements and the building thereon,
iii)	Reference to schedule identifying and describing the property	described in the schedule below with all the rights, easements and here-ditaments attached thereto and reputed tobe attached thereto
5	Consideration, terms and conditions of payment	
i)	Agreed consideration (for the property)	for a consolidate consideration of Rs............... only.
ii)	Encumbrance if any (such as mortgage)	free from all encumbrances.
iii)	Schedule and terms of payment	NOW THIS DEED WITNESSETH that in consideration of the sum of Rupees...... paid by the (purchaser) to the vendors on the .... day of (month)...... (year) as sale advance out of the total sale price of Rs.................. and the balance of Rs......................... ..paid by the purchaser to the vendors on......... the receipt and satisfaction whereof the vendors hereby fully acknowledge of Rs..................only
6	Transfer and conveyance of	
i)	title	the vendors as the full owners hereby transfer, convey, assign and confirm and have this day delivered

ii)	possession	vacant possession unto the purchaser all those pieces or parcelsof land along with the building situated therein more particularly described in the schedule hereunder and all
iii)	rights	rights, liberties, privileges, easements, claims, ways and all the estate right, title and interest therein and other similar rights thereto pertaining and the benefit of all indemnites and covenants to which the vendors are entitled in connection the benefit have and
iv)	to be held in perpetuity ("to hold" is 'to possess')	to HOLD the same unto and to the use of the purchaser, absolutely for ever.
7	Covenants, restrictions and consents affecting the title	
i)	Restrictive covenants.	The vendors covenant with the purchaser as follows:
ii)	Easements	The vendors hereby assign to the purchaser free from any encumbrance or liability whatsoever all the right, title, interest estate and possession in the scheduled properties
iii)	Specific performance clause	The vendors hereby acknowledge the receipt of the full sale consideration of Rs........only. The vendors put the purchaser in possession of the schedule properties along with all the improvements and building thereon and the easements attached thereto and the purchaser shall here-after peaceably hold and enjoy the schedule properties as the absolute owner as provided in this document without any claim or demand whatsoever from the vendors or anyone

claiming through or under the vendors and the purchaser shall effect appropriate mutation in the Transfer of Registry at............and shall pay hereafter all the taxes, levis rates, ceases and fees relating to the scheduled properties.

iv) Assurance

The Vendors hereby assure the purchaser that the schedule properties are free from any encumbrance or liability, court orrevenue attachments, any pending land acquisition proceedings or freezing notification initiated by the .... or Housing Board or Local bodies or Boards and that there are no other claimants to the scheduled properties other than the vendors and that there are no claims hatsoever pending settlements relating to the schedule properties and the vendors are not in possession of any land in excess of the ceiling area prescribed under the ....Act. If contrary to the above assurance and covenants of the vendors the purchaser happens to incur any loss whatsoever directly as a result of undisclosed debts claims charged on the schedule of properties, the Vendors hereby agree and undertake to indemnify and keep indemnified the purchaser from all losses or liabilities whatsoever and the Vendors and all their properties should be liable to the purchaser. The Vendors further assure the purchaser that the vendors shall at the cost of the purchaser execute or cause to be executed any further documents to more fully assure the properties to the purchaser in tune with the true intent and spirit of the this deed, if so required by any lawful authority.

8. Witness

ANNEXURE 2.1

DATA REQUIRED FOR DEVELOPMENT OF A LAND

1. Micro - environment and orientation :-

1.1. Neighbours.

1.2. Orientation of the plot.

1.3. General wind direction prevailing in different seasons of the year.

1.4. Layout and elevation of neighbouring properties.

1.5. Landscape of adjacent lands.

1.6. Any disturbance or restriction due to highway, aerodrome, etc., nearby.

2. Site Particulars

2.1. Area of site, dimensions of all boundaries and critical diagonals.

2.2. Existing features on the land (wells, paths, roads, drains).

2.3. Adjacent buildings, roads, drainage, water supply and electricity services.

2.4. Existing service lines passing through the site (indicate clear heights required and if any service line is to be shifted or adversely affecting the development).

2.5. Layout of filtered water supply mains near the site. (Mention the material and diameter of the pipe).

2.6. Position of any significant tree with its name.

3. Soil Data

3.1. Soil classification (shown on a typical cross-section of pits 2.5 to 3 metres deep near the site).

3.2. The level of the underground water in the locality :

(a) In dry season.
(b) In wet season.

3.3. Type of building and foundation adopted in surrounding area for similar plots of land.

3.4. Presumptive safe bearing capacity of soil and depth of foundation.

3.5. Liability of flooding.

3.6. Special feature/problem, if any.

4. Filtered Water Supply

4.1. a) Name of Municipal/Local Authority for water supply connection.

b) Will sufficient quantity of water of acceptable quality be available?

c) Distance of the source from the periphery of the plot.

d) Time and duration of water supply.

f) Any restriction on the supply (such as in the dry season) ?

4.2. If public water supply is not available, indicate :

a) System existing in adjacent areas for potable water supply (Open-well, tube-well or any other source. Quality of water).

b) Anticipated depth below ground level where water may be struck.

c) Expected yield of the tube-well or open-well and the proposed diameter.

d) Approximate cost to install a tube-well or an open-well.

e) Possibility of pumping from existing open-wells, if any.

f) Result of exploratory wells in the proximity.

5. Sewage Disposal

5.1. If public sewerage system exists,

a) The distance from the site to the point of sewer connection.

b) Diameter of the sewer line.

5.2. If a sewerage system does not exist.

a) In the case of septic tank, the outfall for disposal of effluent. Whether the treatment of the effluent is required.

b) Approximate cost of the system.

6. Electric supply

6.1. Source.

6.2. Reference to local bye-laws, regulations and tariff.

6.3. Maximum load that can be connected to the L.T.

6.4. Any serious voltage fluctuations and load shedding schedule.

6.5. Distance of the site from the nearest power supply point (H.T or L.T.) and whether this can be extended to the site.

7. Storm water drainage

7.1. High flood level and invert level of the public storm water drain.

7.2. Intensity of rainfall.

ANNEXURE 2.2

Cost Index for buildings with load bearing construction (at............as on.........with reference to plinth area rates as base 100 at ....as on ....)

Sl. No.	Description	Unit	Qty	Base rate Rs.	Weigh-tage	Rate at site	Cost Index
1	Cement	Quintal	1.50	250	9.50		
2	Steel Reinforcement	Quintal	0.18	1500	7.00		
3	Sand	Cu.m.	0.50	230	3.00		
4	Aggregate				3.00		
4.1.	20 mm.	Cu.m.	0.18	320			
4.2.	40 mm.	Cu.m.	0.18	300			
5	Bricks	1000	0.40	1500	15.00		
6	Centering & Shuttering	Sq.m.	1.40	100	3.00		
7	Doors & Windows				13.00		
7.1	Hardwood for frames	Cu.m.	0.01	20000			
7.2.	30 mm thick Flush door shutter	Cu.m.	0.005	25000			
7.3	Wood planks for windows	Kg.	3	50			
7.4	Mild steel grill (decorative)						
8	Flooring				2.00		
8.1	White cement	Quintal	0.08	600			
8.2.	Marble chips & powder	Quintal	0.40	100			
9	Cupboard	Sq.m.	0.07	2500	4.00		
10	Paints & Distempers				2.00		
10.1	Paint	Litre	0.13	190			
10.2	Distemper	Kg.	0.40	60			
10.3	Cement paint	Kg.	0.90	30			
11	Internal Water Supply and						

Sl. No.	Description	Unit	Qty	Base rate Rs.	Weigh-tage	Rate at site	Cost Index
	Sanitary Installation						
11.1	G.I. Pipe						
	15 mm. & 20 mm	Metre	0.50	40	0.75		
11.2	S.C.I. Pipe 100 mm	Metre	0.20	190	0.75		
11.3	Sanitary Utilities	Each	0.06	1600	2.50		
11.4	Ceramic Tiles	Sq.m.	0.33	400	3.00		
12	Internal Electrical Installation						
12.1	Black conduit points with copper wires	Metre	1.35	22	0.50		
12.2	1.5 Sq.mm.	Metre	5.00	4.50	3.00		
12.3	4.0 Sq.mm.	Metre	2.00	11.00	0.50		
12.4	Ceiling fans	Each	0.50	900	1.50		
12.5	Light fitting	Each	0.10	275	1.00		
12.6	M.C.B, D.B, meter and Switch	Set	0.02	1.50			
13.0	Labour			24.00			
13.1	Unskilled	Each	6.00	65			
13.2	Skilled	Each	6.00	100			

Total Weightage = 100.00

ANNEXURE 2.3

Cost Index for buildings with reinforced concrete framed construction (at.......... as on.......... with plinth area rates at .... as on .... as base 100)

Sl. No.	Description	Unit	Qty	Base rate Rs.	Weigh-tage	Rate at site	Cost Index
1	Cement	Quintal	2.00	250	11.00		
2	Steel Reinforcement	Quintal	0.40	1500	13.00		
3	Coarse Sand	Cu.m.	0.35	290	2.00		
4	Aggregate 20 mm.	Cu.m	0.40	320	3.00		
5	Bricks	1000	0.30	1300	9.00		
6	Centering and Shuttering	Sq.m.	3.00	100	7.00		
7	Doors & Windows				9.00		
7.1	Pressed Steel Door Frame	Metre	0.50	145			
7.2.	Flush Door Shutter 30 mm thick	Sq.m.	0.15	550			
7.3.	Steel Window	Sq.m	0.15	800			
7.4	Mild steel grill (decorative)	Kg.	3.00	50			
8	Floor & wall tiles	Sq.m.	1.25	350	9.00		
9	Paints & Distempers				2.00		
9.1	Paint	Litre	0.13	190			
9.2.	Distemper	Kg.	0.40	60			
9.3.	Cement paint	Kg.	0.90	30			
10	Internal Water Supply and Sanitary Installation						
10.1	G.I. Pipe 15 mm. & 20 mm	Metre	0.50	40	1.00		
10.2	S.C.I. Pipe 100 mm	Metre	0.25	190	1.00		
10.3	Sanitary Utilities	Each	0.06	1600	2.50		
11	Internal Electrical Installation						
11.1	Black conduit	Metre		1.35	22	0.50	

Sl. No.	Description	Unit	Qty	Base rate Rs.	Weigh-tage	Rate at site	Cost Index
	Points with copper wires						
11.2	1.5 Sq.mm.	Metre	2.50	9.00	3.00		
11.3	4.0 Sq.mm.	Metre	1.00	45	1.00		
11.4	Ceiling fans	Each	0.50	900	1.50		
11.5	Light fitting	Each	0.10	275	1.00		
11.6	M.C.B,D.B, Meter and Switch				1.00		
12	Labour				22.00		
12.1	Unskilled	Each	6.00	65			
12.2	Skilled	Each	6.00	100			

Total Weightage = 100.00

ANNEXURE 3.1

CASE LAWS (Extracts only)

CWT Vs. Mrs. Sara Varghese (1991) (Kerala High Court)

The market value has got to be fixed with reference to the particular statute. The approach will differ, according to the nature of the statute, between fiscal statutes or non fiscal statutes. Among the non-fiscal statutes, The Income tax Act, the Wealth-tax Act, the Gift-tax Act, the Municipalities Act etc., are important.

CWT Vs. Raghubir Narain Singh (1984)

The market value of an asset would be a question of fact, but if the Tribunal has arrived at its conclusion by taking wrong principles into consideration, then such a finding would not be binding on the High court.

Krishan Kumar Rawat & Others Vs. Union of India & Others, September, 14, 1994.

The question whether the instance of sale should be relied upon is also a question of fact. It may be the correct depiction of the market value rate or may not be so and, therefore, the market value is to be adopted looking to the rates prevailing in the locality, situation, the potentiality and use of it.

The valuation of the land could be on the basis of comparable cases. It is not the calculation or the manner which could be examined under article 226. Calculation is always a question of fact. Principles of valuation have to be considered.

The valuation has no doubt to be made objectively and not on the subjective satisfaction of the appropriate authority. The figure which is arrived at has to be based on the material record.

There may be certain element of arbitrariness while estimating the market value and it is for reasons alone, that without there being any mandate of the Act, the respondents have issued a circular that the acquisition of the property under Chapter XXC would be if the difference in value and agreed value shown in the instrument is more than fifteen per cent. Thus the fifteen per cent margin covers the estimation part of valuation, so that no injustice is done while acquiring property.

Gold Coast Selection Trust Ltd. , Vs., Humphrey (1949) 17 ITR (Suppl) 19 (HL)

Observed that "Valuation is an art, not an exact science, mathematical certainty is not demanded, nor is it possible." A certain element of guess has to be there based on objective factors having reasonable nexus with the evidence of record. The various factors are there on the basis of which the valuation of the immovable property can be made, appropriate method is to be adopted. It depends on the location of the property, the time when the agreement is entered into similar other objective factors. The valuation, therefore, has to be done by a method which is more objective and could furnish reliable data to arrive at a just conclusion.

The Dollar Company, Madras, Vs. Collector of Madras, May 5, 1968 (Supreme Court)

The main criterion to determine the market value is that a willing purchaser would pay a willing vendor. An actual transaction with respect to the specific land of recent date is a guide book that courts may not neglect when called upon to fix the precise compensation. The best evidence of the value of the property is the sale of the very property to which the claimant is a party. If the sale is of recent date, then all that need normally be proved is that the sale was between a willing purchaser and a willing seller, that there has not been any appreciable rise or fall since and that nothing has been done on the land during the short interval to raise its value.

Price paid by the owner recently represents an expression of market value, as bonafide evidence of value subject to such matters as (a) the relationship of the parties; (b) the market conditions and the terms of sale and (c) the date of sale. It may not end the enquiry but goes a long way to solve the problem.

Collector of Jabalpur Vs. Babulal (1961)

1. Compensation must not be determined by reference to the price which a willing vendor might reasonably expect to obtain from a willing purchaser.

2. The value to be ascertained is the value to the vendor and not its value to the purchaser.

3. In fixing the value to the vendor all restrictions imposed on the user and enjoyment of land in his hands are to be taken into

account but the possibility to such restrictions being modified or removed for his benefit is not to be overlooked.

4. Market price is not a conclusive test of real value.
5. Increase in value consequent on the execution of the undertaking for, or in connection with which the purchase is made to be disregarded.
6. The value to be ascertained is the price to be paid for the land and with all its potentialities and by reference not merely to the use to which it is being put at the time at which its value is to be determined but also to the uses to which it is reasonably capable of being put in the future.
7. The true contractual relation of the parties— that of the purchaser and vendor has got to observed by endeavouring to construe it as another contractual relation altogether that of indemnifier and indeminified.
8. The value of the land in general can also be measured by a consideration of the prices that have been obtained in the past for a land of similar quality and in similar positions. But a sale of a plot situated in a locality far removed from the locality in question can furnish no guide for determination of the market value.

Udayan Girija Prasad Vs. Special Land Acquisition Officer (1976) Gujarat High Court

1. Market value is that value which is not affected by any special need of a particular purchase.
2. Where the market value of a built-up structure is to be assessed, one method which could be adopted is to find out the expenditure likely to be incurred for the construction of a similar house as reduced by depreciation.
3. The property in question should ordinarily be valued as a whole composite unit; aggregate of valuation to its different components such as land and structure would normally not give an idea of the market value.
4. The fact that the purchaser or the acquirer of the property does not intend to use the property for the same purpose for which it is used or that he desires to demolish it is irrelevant in determining its market value.

5. The market price is that price which a normal and prudent buyer, would pay after evaluating the prices prevailing in the round about area and which a normal and prudent seller is willing to accept. It is, therefore, the consensus between the buyer and the seller which would decide the price at which a particular property is bought or sold.

Special Land Acquisition Officer, Davagere Vs. P.Verrabhadra and others January 9, 1984 (Supreme Court)

The methods of valuation may be (i) opinion of experts; (ii) the price paid within a reasonable time in bonafide transactions of purchase or sale of lands acquired or of the lands adjacent to those acquired and possessing similar advantages; and (iii) a number of years purchase of the actual or prospective profits from the lands acquired. Normally, the method of capitalising the actual or immediately prospective profits or the rent of a number of years purchase should not be resorted to if there is evidence of comparable sales or other evidence for computation of the market value. It can be resorted to only when no other method is available. The rule of a number of years purchase should not be resorted to if there is evidence of comparable sales or other evidence for computation of the market value. It can be resorted to only when no other method is available. The rule of a number of years purchase is not a theoretical or legal rule, but depends upon economic factors such as prevailing rate of return which a prudent investor in the class of properties in question would expect. The most important of such economic factors is the prevailing rate of interest at the relevant time.

Debi Prasad Poddar Vs. Commissioner of Wealth Tax (1977) Calcutta High Court

(1) Attempt must be made to find out the price which the immovable property would fetch on the valuation date imagining a willing buyer to purchase the property from a willing seller in respect of the property.

(2) In respect of the immovable property there is no fixed market such as market for shares or for other commodities, like sugar, cloth etc.. In order to arrive at a valuation in respect of the property there must be necessarily be certain element of guess. But the guess must be based on certain facts and according to certain principles which would be, in the facts and circumstances if each case, as fair as possible to the revenue as well as to the

assessee in trying to imagine reasonably and intelligently the price which was expected to be fetched if it was possible to sell the property in question on the relevant valuation date.

(3) Such a determination, therefore, involves adopting certain methods in determining in valuation and there are different kinds of methods, as mentioned in the circular of the board and the principles enunciated in the several decisions of the court as noticed before.

(4) Which one of the various methods would be suitable for a particular case must depend on the nature of the property, the location of the property, the purpose for which the property is used and several other objective factors, viz., the time when the valuation is made, the prospect of buying and selling in respect of the property at the relevant time and also special features in respect of the property, if there be any. Taking all these factors into consideration it is, therefore, necessary to determine which one of the various methods will be most suitable to reach as accurate as possible a guess as to the valuation of on the valuation date.

(5) Another factor that has to be borne in mind is that such a demand should be preferred which has a more objective reliable data to rely upon than mere subjective opinions. For instance, if there are more objective data to work out in respect of one method more reliable than another then that method for a particular land should be preferred. If, however, there is any objective reliable evidence of any transaction of sale of the land or property similar on quality or of the same type and in approximately same time then that would, however, provide more reliable method to follow.

Mahabodhi Society of India and another Vs. Union of India and others, January 5, 1994 (Calcutta High Court)

Another fundamental issue raised on behalf of the petitioner is whether where the consideration is imponderable not being reducible to monetary compensation, the chapter can be revoked. Here also I am in agreement with the contents of Mr. BAGCHI. If the consideration for transfer is not monetary consideration or not existing things or is future things not having workable present market value, the machinery for computation of the compensation fails.

Shrichand Raheja and another Vs. S.C. Prasad (Appropriate Authority) and others (Bombay High Court)

Laila Hitchens and another Vs. Union of India and others. September 28/29, 1994.

The authority has pointed out in paragraph 6 of the order that the purpose of quoting sale instances in the show-cause notice is just to show the trend of the fair market value in the vicinity of the subject property. The authority made it clear that the subject property is not identical with the properties given in the instances. The authority further observed that the transferees are bound to put the property to maximum exploitation by building the most modern and good building to fetch the maximum price. The authority took into consideration the price range of Rs. 15000 to Rs.17000 per sq.ft. of built-up area in the locality. A perusal of the order from the authority leaves no doubt that the authority has not relied upon the sale instances cited in the show-cause notice in respect of ready flats to arrive at the price of the property in question. Reference was made to those instances to indicate the potentiality of the property. In our judgment, the conclusion reached by the appropriate authority in the facts and circumstances of the case, cannot be faulted.

Commissioner of Income-Tax,Patiala vs Leatherate industries Ltd., January 2, 1984 (Punjab and Haryana High Court)

In order to determine price of land, the instances of sales should be of similar plots of land in similar locality.

A. Premchand and others Vs. Inspecting Assistant Commissioner of Income-Tax and others (and vice versa), February 27 1985 (Karnataka High Court)

The definition of 'fair value' in s.269A(d) brings to fore the concept of comparable sales method or the sales analysis approach or a mythical willing seller who is under no compulsion to sell and a willing buyer who is under no compulsion to buy. In many a case, it becomes difficult to resort to this method and determine the market value and therefore courts and valuers have adopted other modes or methods called 'capitalisation method and 'rental value method", etc.., but, the other methods must be resorted to only when the fair market value cannot be determined applying the comparable sales method or the sales analysis approach and not otherwise. The rental method. even where it is applied, cannot be applied in isolation and to the exclusion of other recognised method of valuation.

State of Madhya pradesh, Appellant, Man Mohan Swaroop, Respondent.

The Tribunal assessing compensation is required to take into consideration not only the present purpose or the present use to which the land is applied but also any other more beneficial purpose to which it might reasonably be put by the owner. No doubt it is true that regard can be had only to the existing condition and what is likely to happen in reasonably near future and compensation cannot be fixed on the basis of what might happen in the dim and distant future. Where there is a reasonable possibility of the land being put to more profitable use within a reasonable period, the same cannot be ignored in assessing its value. (Compensation has always to be determined with evidence.) It is also true that ordinarily it is wrong to value large areas on the basis of small area sales and vice versa. All the same there may be cases when such a basis may be required to be adopted looking to the entire circumstance of the case. We may also emphasise that there is no real antithesis between agricultural and non-agricultural lands. The same land may be useful for both the purposes. If the land acquired is found to be useful to both for agricultural and non-agricultural purposes merely on the ground that it was used as agricultural land by the owner till the time of its acquisition, its potentiality as non-agricultural land cannot be ignored.

Commissioner of Income-Tax, Gujrat Vs. Sarifabibi Mohmed Ibrahim April 17, 1981 (In The Gujrat High Court)

The fact that a particular piece of land is entered as agricultural land in revenue records and assessed as such under the Land Revenue Code would raise a presumption that the land is agricultural but the presumption can be rebutted by other circumstances pointing to the contrary conclusion. The fact that agricultural operations were carried out in the past or were carried on currently and that it was not converted to non-agricultural user would also raise presumption that the land is agricultural. However, these factors are not decisive in as much as agricultural crop can be raised even on building sites and sometimes a crop is grown in order not to allow the land to remain idle while awaiting sale for non-agricultural purposes or in order to avoid payment of revenue at a higher rate or in order to avoid payment of capital gains tax. The facts that raise a presumption that the land is non-agricultural are -

i) Situation of the land e.g. land situated in urban area within municipal limits in the proximity of buildings and building sites,

ii) sale of land to non-agricultural purposes,

iii) sale of land on a square yard basis at a price comparable to prices fetched by building sites,

iv) sale at a price at which no bona fide agriculturalist operations, and

v) when the price is such that no prudent buyer would sell it at a price worked out on the capitalisation method taking into account its optimum agricultural yield in the most favourable circumstances. When the question arises as to the real nature of land in context of land situated in urban areas like Ahmedabad, Mumbai, Delhi or Chennai, the crucial two-fold test would be to find out if any prudent agriculturalist would purchase the land in order to carry on agricultural operations having regard to the price he would have to pay and whether the owner of such land would sell it by valuing it as property yielding agricultural produce on the capitalisation method even on the basis of optimum yield and maximum sale price. The effect of the totality of the circumstances must be considered.

Where land was sold and the Tribunal held it to be agricultural because it was entered as agricultural land in the relevant records, it was not converted to non-agricultural user till the date of sale and agricultural operations were carried on in the past, but the material on record showed that

i) the land was situated at a distance one kilometre from Surat "railway station and was within the municipal limits and within a town planning scheme;

ii) the sale was on a square yard basis being at Rs.23 per sq.yd.

iii) no agricultural operations such as growing of grains or oil seeds were carried out during the previous years the relevant assessment year and only grass was grown in the last year

iv) the sale was to a building society which was admittedly purchasing it for building houses;

v) an application to sell the land to a non-agriculturalist under the Land and Revenue Code was made months earlier and permission was actually obtained a month prior to the actual sale and

vi) some eleven years earlier, the assessee themselves had converted a part of the land to non-agricultural user and constructed a chawl thereon. Held, on the facts, that the land was non-agricultural land and capital gains tax could be levied on the profits arising from its sale.

Commissioner of Income-Tax Vs. Jumralal Son (Allahabad High Court)

We find the ground given by the tribunal for not considering the rates of the auction sales to be untenable. Auction signifies public sale of property usually conducted by bidding one after the other which augment the price. On the approval of the bid, a contract comes into existence.

Commissioner of Income-Tax, Gujrat Vs Sumatilal Chhotalal Shah November 21, 1979(Gujarat High Court)

That not only the sale instances, remote in point of time from the date of acquisition, could be considered but a general presumption about the all round rise in the prices including that of realty could be raised though it could be rebutted by evidence to the contrary that the price had become stagnant in the locality for some valid reason.

If in the material on record before the competent authority, no other evidence in respect of comparable sale instances is available, the competent authority or the Tribunal cannot brush aside or refuse to consider the evidence of the sales which may be, in a given case, remote in point of time from the date of initiation of the acquisition proceedings.

Surya Kiran Association Vs. Appropriate Authority and Another June 26, 1995 (Gujarat High Court)

Ordinarily wide frontage should be considered as beneficial to the property than narrow frontage. It is true that heavy traffic or vehicular pollution may adversely affect the property but then there must be some material or evidence on record on the basis of which, the appropriate authority may form an opinion by recording definite finding to that effect. In the absence of such finding or material on record, no inference can be drawn nor conclusion can be arrived at that because of proximity to a particular place, there would be a problem of traffic and vehicular pollution.

Gurudatt Villa Association Vs. Appropriate Authority and Another. May 4,1995 (Gujarat High Court)

On, the contrary, looking to the order, one feels that impliedly the averments have been accepted in as much as it is stated in the order that considering the superior location of the Sip, reasonable deduction of 10% can be allowed to the Puc but even then it would come to about Rs.8,064 per sq.mt. Yet the difference would come be more than 15%. We do not appreciate the above approach and reasoning of the first respondent. When no material what so ever has been placed on record as to why the deduction of 10 per cent was considered to be proper, the so called finding can be described as speculative, there being no evidence on record. In our opinion, therefore, ground No1 cannot be said to be legal, valid or germane.

Vimal Agrawal Vs. Appropriate Authority and others, July 27, 1994 (Bombay High Court)

The absolute possession, the physical condition of the property which also depend on the amount of attention given to maintenance and repairs are also relevant factors in determining the fair market value. The level of allowance would, of course, depend on the facts of each case.

The proximity from the time angle, proximity from the situation angle are also relevant considerations ascertaining the most comparable instance. Having identified the instance which provide the index of market value, the price reflected therein must be taken as the norm and the market value of the property under consideration may be deduced by making suitable adjustments for the plus and minus factors *vis-a-vis* property under consideration by placing the two in juxtaposition. The balance sheet of plus and minus factors may be drawn for this purpose and the relevant factors may be evaluated in terms of price variation as a prudent purchaser would do. The fair market value of the property which is the subject of proceedings under section 269UD has thereafter to be deduced by loading the price reflected in the instance taken as the norm for plus factors and unloading it for minus factors. The evaluation of these factors of course will depend up on the factors for each case.

Associated Cement Companies Ltd. and another Vs. Appropriate Authority and others, Mrs. Ruma Pal J., April 20,1993 (Calcutta High Court)

It is not a patent fact that properties in HINDUSTAN Park are less valuable than properties in Ballygunge Circular or Southern Avenue so that the court must take judicial notice of the same.

In urban housing, smaller plots of these sizes which readily attract lower middle class customers, fetch yard wise more price than bigger plots.

Blue Star Limited Vs. Santosh Datta, IAC, and others, September 6, 1993 (Bombay High Court)

By an agreement of sale dated March 21, 1972, the petitioners agreed to purchase from the vendor a certain property for a consideration of Rs, 3,60,000/-. The petitioners paid the entire consideration on March 22, 1972, and took possession of the property, but the actual conveyance was executed on June 29, 1977, was registered on October 5, 1978. Held, that the property was sold on March 21, 1972, and what was only left to be done was execution of the conveyance and the registration thereof.

Wenger & Co. and others Vs. District Valuation Offices and others, Prakash Narain and Mrs. Leila Seth J. August 30, 1978 (Delhi High Court)

It is one of the settled principles of valuation that market value has to be ascertained by considering sales of similar properties in the same neighbourhood or similar environment. If there are no such instances of sale available, then capitalisation of rent or making some sort of comparative evaluation of sales of other properties is an acceptable mode of valuation.

The petitioners had full opportunity to give evidence of valuation and contest the proposed valuation by respondent No.1. they could have produced tangible evidence of what could be the fair market value.

Krishnakumar Tawat & others Vs. Union of India & others V.K. Singhal J. September 14, 1994

Under this method, the valuation of the land is done separately on the basis of comparable sale instances of the sale of other plots and the cost of construction as prevailing is taken from which the depreciation looking to the year of construction is reduced. This method is normally applied in cases of compulsory acquisition.

V.G. Ramchandran Vs. C.W.T. Karnataka

Held that the Tribunal was right in law in holding that the valuation of the self -occupied property of the assessee ascertained by adopting the Land and Building Method, should be taken as the value of that property for assessing the tax liability under W.T. Act, 1957 for assessment year 1970-71 and 1971-72.

R.C Cooper Vs. Union of India (Supreme Court)

i) The method of capitalisation of rental value with an appropriate multiplier is a satisfactory method of valuation of land and buildings, if only that land has been put to full use legally permissible and economically justifiable and the income is commercial and not a controlled return or a return depreciation on account of several circumstances.

ii) If the property is not put to full use or return is nor commercial, capitalisation of rental value pegged down by statutorily by the provisions of the rent control legislation yields misleading results and cannot be considered as fair market value of the property.

iii) Vacant premises have considerably larger value than premises which are occupied by tenants.

Smt Bani Roy Chowdhary Vs. Competent Authority (1978) (Calcutta High Court)

Under the prevailing building regulations of the corporation of Calcutta in the area where the said property is situated fifty per cent of the total land has to be left open in constructing a building. Thus, at least over 12 cottahs of land had to be left open but the land left open being approximately 7 cottahs 3 chittaks was less than the requirement under the said building regulations. In our view, there is, therefore, no scope for development of the said property either immediate or in the near future, so long as the existing building and outhouses remained and so long as the tenants did not vacate, who are, no doubt, protected under rent control legislations.

Mrs. Rutty Rajammannar Vs. C.I.T. 1985 (Madras High Court)

Held that the Tribunal had in respect of certain properties determined the value of the super structure and the land on which the superstructure stood on the rental method and valued the lands which were not appurtunent to the building seperately. As the S.7 of the W.T. Act,1957 defines the market value as the price the property would fetch in the open market, the W.T. authorities were entitled to adopt such methods as would enable tham to determine approximately the market value. In as much the Tribunal had found that the rental agreements had not *been shown to include the vacant lands around the buildings, the method of valuation adopted by it was justified.*

Sahib Singh Kalha Vs. Amritsar Improvement Trust, 1972

Where there is large area of undeveloped land under acquisition, provision has to be made for providing the minimum amenities of town life such as water connections, well laid-out roads, drainage facility, electric connections etc.. the process necessarily involves deduction of the cost of factors required to bring undeveloped lands on par with the developed lands.

Mirza Nausherwan Khan Vs. Collector, Land Acquisition, 1974 (Supreme Court)

There is no doubt that the value of an extensive plot of land in a city, the strip that adjourns an important road will have a higher value than what is in the rear, for obvious reasons of potential user or commercial exploitation.

Nitya Gopal Sen Poddar Vs. Secretary of State, 1933 (Calcutta High court

"Now so far as the system of belting is concerned it is a system which is widely used, but its value as a system depends much upon a variety of facts. If data are available showing as it is situated at a particular distance from a main road or thoroughfare, the system would be perfectly scientific"

Commisioner of Income Tax, Gujarat Vs. Trustees of Shri Maneklal Chunnilal Shah Trust, August 22,23, 1978 (Gujarat High Court)

There can be no question of threating him (Valuation Officer) as a witness. He is not a party to appear or in the proceedings before the competent authority. He is permitted by the statute to appear as an expert assisting the Tribunal on the technical aspectsof the question regarding the determination of the fair market value in the light of known principles of valuation of property. In the light of the concept of an oppurtunity of being heard, it will be open to the valuation officer, functioning under s.269L(3), to make his written submissions or offer oral comments.

ANNEXURE 3.2

Rates of Capitalisation

Sl. No.	Type of Property	A class B class cities, state capitals and industrial cities	other smaller cities
1.	Secured ground rent	7.50	7.00
2.	Residential	8.00	7.50
3.	Offices	9.00	8.00
4.	Commercial Offices/ factories/ godowns	9.50	9.00
5.	Shops/hotels/ restaurants	10.00	10.00

Note : These rates of capitalisation suggested by the author are applicable for properties with market rents.

ANNEXURE 3.3

Fair Market Value by Rent Capitalisation Method (of Tenanted premises with no scope for further development)

A. Rent Capitalisation

1.1. Gross monthly rent

1.2. Gross yearly rent

1.3. Outgoings

a) Municipal and other taxes

b) Maintenance and repairs

c) Collection charges

d) Ground rent

e) Insurance

f) Common service charges (if not recoverable from the tenant)

g) Any other miscellaneous charges payable by the owner

1.4. Net yearly income (1.2) - (1.3)

1.5. Estimated future life

1.6. Rate of capitalisation

1.7. Rate of redemption of capital

1.8. Years' purchase

1.9. Capitalised value of rented portion of the premises (1.8)* (1.4)

B. Reversionary Value of Land (if estimated future life is less than say 15 years)

1.10. Area of land

1.11. Rate of land (indicate basis of adoption)

1.12. Rate of reversionary interest

1.13. Reversionary value

C. Excess land beyond the land appurtenant to the building

1.14. Actual plinth area of building

1.15. Area of land appurtenant to the tenanted building

1.16. Net area of excess vacant land (1.10) - (1.15)

1.17. Land rate

1.18. Value of excess land (1.16) * (1.17)

1.19. Fair market value of the entire property = (1.9 + 1.13 + 1.18)

ANNEXURE 3.4

Fair Market value of Land and Building by Profit Method

A. Gross annual income

B. Deduct the cost of input and operating expenses (Including salaries and expenses of the management, tax and other maintenance expenses on the assets)

C. Deduct for owners risk and enterprise @ 15% on (A-B) (The rate of return depends on the nature of enterprise and the rate of return)

D. Net annual income (A-B-C)
Economic life of the enterprise (say) 30 years
Rate of capitalisation = 10 per cent (from Annexure 3.2)

E. Years' purchase = (see standard dual table)
Capitalised value is = D*E

F. Reversionary Value of Land
Rate of capitalisation (for secured ground rent) =
Present worth of land (which will revert after say30 years) = (from standard table)

ANNEXURE 4.1

Classification of a Property and its Immediate Neighbourhood

1. A copy of the zonal development plan of the neighbourhood showing the property and its neighbourhood is enclosed — Yes/No

2. Classification of the properties along the roads as V.I.P, H.I.G, M.I.G or L.I.G — Name of Road — Classification

   (a) Along the road in front (up to next crossings)
   (b) Along the roads in the immediate neighbourhood (between adjacent crossings)
      i) Next road in front
      ii) Road in the rear
      iii) Road falling on side 1
      iv) Road falling on side 2

3. Classify neighbouring properties as V.I.P, H.I.G, M.I.G, or L.I.G

   Side - 1
   Side - 2
   Front
   Rear

4. Civic amenities in the neighbourhood

   a) Transport facility : Common mode — Level of satisfaction

   b) Other civic amenities (primary, public and high school, college, neighbourhood and district park, playground, market, shopping centre for daily necessities, restaurant, movie or entertainment and dispensary) — Location — Class

5. Predominant buying motives of the prospective buyer group (apart from livelihood) — Extent of satisfaction Very good / Good / Poor

a) Business related or profit

b) Comfort and convenience — Weightage

HIG MIG

c) Prestige

6. a) Classification as per town planning layout (e.g. plot sizes, population density and civic amenities) — VIP, HIG, MIG or LIG

b) Development of the neighbourhood — Developed, Developing or yet to develop

c) Depreciation of the neighbourhood properties .... Per cent

7. Special advantages and disadvantages of the neighbourhood :

a) Advantages :
b) Disadvantages :

8. Overall classification as VIP, HIG, MIG or LIG :

a) Property
b) Immediate neighbourhood

ANNEXURE 4.2

Description of an Urban Land

1.	Property address			
2.	Description	i)	As per title	Copy of schedule attached
		ii)	As at site	Adimensioned site plan is attached
3.	i) Title			clear/encumbered, if any
	ii) Nature of title (including lease and acquisition aspects)			
	iii) Legal disputes, if any			
	iv) Rights of public and adjoining owners, if any			
	v) Any adverse effect on the development potential (if tenanted, give details as per Annexure 3.3)			
	vi) Whether permission is required before taking up site development (such as to cut trees etc.)			
4.	Development potential			
a)	Comprehensive development plan and Bye-laws applicable			
b)	Category		Property	Neighbourhood
	i) Permissible use			
	ii) Present use			
c)	Zonal Development Plan/Town Planning scheme			Sheet No.
d)	Classification of i) Locality			VIP /HIG/MIG/LIG
	(As per Annexure 4.1) ii) Neighbourhood			VIP /HIG /MIG/LIG
e)	Apartments			
	Permitted			Yes / No
	Existing			Yes / No
f)	Length of frontage			
g)	Depth of plot			

h) Width of access road

i) Transport facility — Mode — Distance (Km) — Schedules:

j) Proximity to other civic amenities — primary, secondary & public Schools, College, Dispensary, Market, Park (neighbourhood & district) Playground, Movie or entertainment, Restaurant and Neighbourhood shopping centre — Location — Distance (Km) — Class

k) Saleability

i) Number of Lands available for sale in the neighbourhood

ii) Number of vacant (or nearly vacant) lands in the neighbourhood

iii) Demand based on recent sales (and enquiries) — High /Average /Low

l) Special advantages

m) Special Disadvantages

i) Any restrictive covenant (e.g. lease, notified for acquisition, occupancy etc.)

ii) Physical (e.g. terrain and lack of civic services e.g., sewerage/ corporation water supply etc.)

iii) Legal (e.g. litigation)

iv) Encumbrance (Attach a copy of Encumbrance Certificate)

n) Zone (As per development control rules)

Land use

i) Permissible — Commercial/Residential/Semi-Public Mixed/Industrial

ii) Actual in the neighbourhood — Commercial/Residential/Semi-Public Mixed/Industrial

p) Floor area ratio/Floor space index

  i) Permissible

  ii) Maximum achieved in practice in the neighbourhood

  iii) Actually achieved

q) Ground coverage

  i) Permissible

  ii) Actually achieved

r) Eminent future development in the locality :

s) Investment in the development of the neighbourhood during last three years (other than housing)

ANNEXURE 4.3

Report on the Fair Market Value of a Property

(when the value of the building is less than fifteen percent of total)

1. Property address :
2. Purpose of valuation:
3. Value as on :
4. Is the property occupied by the owner?: Yes/No.
5. If partly or wholly tenanted, specify separately, the extents tenanted and owner occupied :

6. Description of property : (enclosed as per Annexure 4.2.) :

A. LAND

a) Area
as per agreement :
as measured :

b) Land Rate

c) Value of land

B BUILDING : (Details of reproduction cost, for value upto fifteen per cent. If the value is more, details are required for value approach.)

a) Type : H.I.G./M.I.G./L.I.G.

b) Year of construction :

c) Plinth area :

d) Brief specifications :

1. Foundation
2. Superstructure
3. Floor
4. Roof
5. Water supply and sanitary installations : H.I.G/M.I.G./L.I.G
6. Electrical service : H.I.G/M.I.G/L.I.G.

e) Estimated future economic life

f) Reproduction cost and value

1. Reproduction cost
2. Depreciated value
3. Salvage value

C. APPURTENANT CONSTRUCTION

a) Compound wall

b) Other details (e.g. out-house)

c) Value

1. Depreciated value
2. Salvage value

7. Method of valuation :

8. Comparable sale instances:

9. Fair market value of the property :

ANNEXURE 5.1

Details for valuation of a building

1. Type of building
   - i) Structure — Load bearing walls/ Framed structure (with beams and columns)
   - ii) Construction — H.I.G. / M.I.G. / L.I.G
2. Number of floors and height of each floor
3. Plinth area *
4. Year of construction
5. Specification and the condition of building component — Specification — Rating * * Excellent/Very good/ Good/Fair/Poor
   - i) Foundation — Traditional/Strip/Raft/Piles
   - ii) Walls
   - iii) Doors
   - iv) Windows
   - v) Cupboards
   - vi) Flooring
     - a. Kitchen
     - b. Bath and Water Closet
     - c. Other areas
   - vii) Finishing
     - a) Internal
     - b) External
   - viii) Roof and terracing
   - ix) Special architectural or decorative features
6. Anticipated future economic life of building (based on Rating)

7. Electrical service
   - a) Construction
     - i) Internal wiring
     - ii) Fittings
   - b) Anticipated future economic life

8. Water supply and sanitary installation
   - a) Number of bath rooms and water closets (rooms)
   - b) Type of fittings — Superior coloured/ ISI marked/ordinary
     - i) Water Closets, Numbers Indian Type European Type
     - ii) Bidet
     - iii) Wash basins
     - iv) Other fittings (specify type)
     - v) Pipes and joints
   - c) Anticipated future economic life

9. Development of site — Type and capacity (and enquiries)
   - a) Sump and pump
   - b) Overhead tank
   - c) Tubewell and pump

N.B. * Specified floorwise, if different.

** Rating is based on evaluation of the present condition, overall see Annexure 5.2.)

ANNEXURE 5.2

Criteria for Rating of a Building

1. Planning efficiency (floorwise)
2. Type of construction

	Criteria	: Prevent cracks		Provide support
i) Foundation				
ii) Plinth				
iii) Basement				
iv) Walls/Superstructure				
a) External				
b) Internal				
v) Roof	Vapour resistance	Thermal resistance	Security	Aesthetics
vi) Doors	Security	privacy	Aesthetics	
a) External				
b) Internal				
vii) Windows	Security	Shading	Privacy	Aesthetics
viii) Grills	Security	-	Privacy	Aesthetics
ix) Cupboards	Security	Storage	Privacy	Aesthetics
x) Floor	Smooth but non-skid	Reflectance	Hardness strength	Transverse Aesthetics
a) Kitchen				
b) Bath and Water Closet				
c) Other areas				
xi) Finishing	Vapour Resistance	Reflectance	Aesthetics	
a) Internal				
b) External				
c) Terrace				
d) Roads and pavements				
e) Sewage disposal				
f) Compound lighting				

g) Landscaping

h) Special repairs needed (see Annexure 5.5)
   i) Details
   ii) Cost

j) Houses built last year in the neighbourhood
   i) Number
   ii) Cost of each (approx.)
   iii) Plinth area of each

N.B. * Specified floorwise, if different.

** Rating is based on evaluation of the present condition according to the criteria of performance specifications (see Annexure 6.1.)

ANNEXURE 5.2
(Contd....)

Additional Details for Superior (VIP) Buildings

A)	Architectural quality and Aesthetics	Rating :	Excellent/V.Good/Good
		Details	
1.	Visual appeal and Aesthetics		
	i) Character and personality	:	
	ii) Landscape Development	:	
	iii) Facade and External decorative features	:	
	iv) External colour scheme & finish (I/C durability)	:	
	v) Internal colour scheme & finish	:	
	vi) Lines & levels	:	
	vii) Attractive features	:	
2.	Building orientation & design of openings	:	
3.	Layout & design of internal spaces.	:	
4.	Satisfaction of functional requirement of users	:	
5.	Lay-out & design of ext. utilities.	:	
6.	Harmony with physical & cultural environment.	:	
B)	Quality of materials and construction	:	Very Good/Good
1.	Roofing & projections	:	
2.	Ext. finish	:	
3.	Wood work	:	
4.	Flooring	:	
5.	Internal finish	:	
6.	Services	:	

ANNEXURE 5.3

Calculation of Plinth Area Rate and Cost Index for load bearing construction (at......... as on..........) for High Income Group

(Cost Index with reference to plinth area rates as base 100 as on....)

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific- ation
1.	Cement	Quintal	1.50					IS269
2.	Steel Reinforcement	Quintal	0.18					IS1786
3.	Sand	Cu.m.	0.50					IS383, 1542, 2116
4.	Aggregate							
4.1.	20 mm.	Cu.m.	0.18					IS 383
4.2.	40 mm.	Cu.m.	0.18					IS383
5.	Bricks	1000	0.40					IS1077
6.	Centering & Shuttering	Sq.m.	1.40					
7.	Doors & Windows							
7.1	Teakwood for frames	Cu.m.	0.01					IS190,1326
7.2.	Flush Door Shutter 30 mm thick	Sq.m.	0.15					IS2202
7.3.	Teak wood planks for windows	Cu.m.	0.005					IS1141, 190,1326
7.4	Mild steel grill (decorative)	Kg.	3.00					IS4351
8.	Flooring							IS8042
8.1.	White cement	Quintal	0.15					
8.2.	Marble chips & powder	Quintal	0.40					
9.	Cupboard	sq.m	0.10					
10.	Paints & Polish							
10.1	Polish	Litre	0.13					

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific-ation
10.2	Plastic emulsion paint	Litre	0.50					
10.3	Cement paint	Kg.	0.90					IS5410
11.	Misc. Materials							
12.	Labour							
12.1	Unskilled	Each	5.00	per sq.m. plinth				
12.2	Skilled	Each	5.00	per sq.m. plinth				
13.	Contractor's Profit							

Total Weightage = 100.00

ANNEXURE 5.3

Internal Water Supply and Sanitary Installation

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific-ation/ Band
1.	Tile							Best available
1.1.	Non Skid Ceramic (Floor)	Sq.m.	0.10 per Sq.m plinth					
1.2.	Ceramic (Wall)	Sq.m.	0.25 " "					
1.3.	Printed (Wall)	Sq.m.	0.05 " "					
2.	Sanitary utilities							Best available
2.1.	European type W.C. (light colour)	Each	3					
2.2.	Orissa type W.C.	Each	1					
2.3.	Flushing cistern, a) Vitreous China (light colour)	Each	3					
	b) P.V.C.	Each	1					
2.4.	Wash basin with pedestal (light colour)	Each	4					
2.5.	Sink & drainboard	Each	2					
2.6.	Bath tub							
	a) Vitreous enamelled	Each Steel	2					
	b) Glass fibre	Each	1					
3.	Pipes & Joints							
3.1.	G.I. Pipe 15 mm & 20 mm	Metre	0.50 per sqm					IS1239,IS4736
3.2.	S.C.I. pipe 100 mm	Metre	0.20 per sqm					IS1729
3.3.	Pig Lead	KG	0.50 per sqm					IS782
4.	Fittings							Best available
4.1.	Mixer & Stop cock	set	5					
4.2.	Shower	set	3					
5.	Miscellaneous items							
6.	Labour							
6.1	Skilled	Each	0.5 per sqm plinth					
6.2	unskilled	Each	0.5 " " "					

Total weightage 100.00

ANNEXURE 5.3

Internal Electrical Installation

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific-ation/
1.	Black conduit	Metre	1.35					
2.	Points with copper wires							
2.1.	5 Amperes	Each	37					IS 694
2.2.	15 Amperes	Each	7					IS 694
3.	Fans	Each	10					IS 734 3212
4.	Light fitting	Each	20					IS 8828
5.	M.C.B.	Set	2					
6.	E.I.C.B.	Each	1					
7.	Switch	Each	1					
8.	Labour							
8.1.	Unskilled	Each	0.50 per sqm plinth					
8.2.	Skilled	Each	0.50 per sqm					
9.	Misc.							

Total weightage = 100.00

ANNEXURE 5.4

Calculation of Plinth Area Rate and Cost Index for load bearing construction (at.......... as on..........)for Middle Income Group

(Cost Index with reference to plinth area rates as base 100 as on......)

Sl. No.	Description	Unit	Qty	Basic rate	Weightage	Rate at site	Cost Index	Specification/
1.	Cement	Quintal	1.50					IS269
2.	Steel Reinforcement	Quintal	0.18					IS1786
3.	Sand	Cu.m.	0.50					IS383, 1542, 2116
4.	Aggregate							
4.1.	20 mm.	Cu.m.	0.18					IS 383
4.2.	40 mm.	Cu.m.	0.18					IS 383
5.	Bricks	1000	0.40					IS 1077
6.	Centering & Shuttering	Sq.m.	1.40					
7.	Doors & Windows							
7.1	Pressed steel door frames	Metre	0.50					IS 1038
7.2.	Flush Door Shutter 30 mm thick	Sq.m.	0.15					IS 2202
7.3.	Mild Steel Window with grill	Sq.m.	0.15					IS 4351, 1038
7.4	Mild steel grill (decorative)	Kg.	3.00					
8.	Flooring							
8.1.	White cement	Quintal	0.08					IS 8042
8.2.	Marble chips & powder	Quintal	0.40					
9.	Cupboard	Sq.m.	0.10					
10.	Paints & Distemper							
10.1	Polish	Litre	0.13					IS2932

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific-ation/ Band
10.2	Plastic distemper	Kg	0.40					IS 5410
10.3	Cement paint	Kg.	0.90					
11.	Misc. Materials							
12.	Labour							
12.1	Unskilled	Each	5.00 per sq.m. plinth					
12.2	Skilled	Each	5.00 per sq.m. plinth					
13.	Contractor's Profit							

Total weightage = 100.00

ANNEXURE 5.4

Internal Water Supply and Sanitary Installation

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific-ation/ Band
1.	Tile							
1.1.	White Nonskid (Floor)	Sq.m.	0.08 per Sq.m plinth					
1.2.	White glazed (wall)	Sq.m.	0.25					IS2556
2.	Sanitary utilities							
2.1.	European type W.C. (white colour)	Each						
2.2.	Orissa type W.C. (white)	Each	1					IS7231
2.3.	Flushing cistern. P.V.C.	Each	3					
2.4.	Wash basin (white)	Each	4					
2.5.	Fireclay sink (white)	Each	1					
3.	Pipes & Joints							
3.1.	G.I. Pipe 15 mm & 20 mm	Metre	0.50 per sqm					IS1239.IS4736
3.2.	S.C.I. pipe 100 mm	Metre	0.20 per sqm					IS1729
3.3.	Pig Lead	KG	0.50 per sqm					IS782
4.	Fittings							IS781, IS4827
4.1	Bibcock\ Stop Cock\Shower	Each	14					
5.	Miscellaneous items							
6.	Labour							
6.1.	Skilled	Each	0.40 per sq.m plinth					
6.2.	Unskilled	Each	0.40 per sq.mplinth					
7.	Contractor's profit							

Total weightage = 100.00

ANNEXURE 5.4

Internal Electrical Installation

Sl. No.	Description	Unit	Qty	Basic rate	Weigh tage	Rate at site	Cost Index	Specific- ation/
1.	Black conduit	Metre	1.35					
2.	Points with copper wires							
2.1.	5 Amperes	Each	25					IS694
2.2.	15 Amperes	Each	4					IS 694
3.	Ceiling fans	Each	6					IS734, 3212
4.	Light fitting	Each	15					IS 8828
5.	M.C.B.							
Set	2							
6.	Meter & Switch	Set	1					
7.	Misc.							
8.	Labour							
8.1.	Unskilled	Each	0.50 per sqm plinth					
8.2.	Skilled	Each	0.50 per sqm		"			
		Total	weightage		100.00			

ANNEXURE 5.5

Survey of a Building to Identify Components Needing Special Repairs

Building Component	Structural defect	If yes, mark
1. Foundation and Plinth	i) Excessive settlement	
	ii) Cracks	
2. Basement and ground floor		
a. Floor	i) Damp	
	ii) Leaking	
	iii) Cracks	
b. Wall	i) Damp	
	ii) Bent	
	iii) Reinforcement corroded	
3. Superstructure		
a. Floor	i) Dampness in wet areas	
	ii) Improper slope in wet areas	
	iii) Reinforcement corroded (cover sounds hollow when tapped)	
b. Walls	i) Dampness in exposed walls	
	ii) Joint open between main and partition wall	
	iii) Cracks	
4. Roof	i) Water stagnating on roof	
	ii) Cracks in roof covering	
	iii) Reinforcement corroded	
	iv) Excessive sag	
5. Staircase	i) Hand rail needs replacement	
	ii) Nosings need replacement	
	iii) Damp walls and roof	
6. Doors, windows and cupboards	i) Dry/wet rot	
	ii) Warping	
	iii) Out of shape and loose joints	
iv) Termites		
	v) Steel is corroded	
	vi) Welding is cracked	

Building Component	Structural defect	If yes, mark
7. Finishing		
a. Plaster	i) Sounds hollow when tapped	
	ii) Uneven (seen with parallel light)	
	iii) Damp patches	
	iv) White patches (due to excess salt in bricks)	
	v) Wall tiles sound hollow when tapped	
b. Floor	i) Sounds hollow when tapped	
	ii) Needs regrinding	
	iii) Many cracks	
8. Sanitary installation	i) Broken or cracked utilities	
	ii) Foul smell	
	iii) Joints leak (wet surfaces near joints)	
	iv) Sewage overflow/blockage	
9. Water supply	i) Rusted pipes	
	ii) Leaking joints	
	iii) Tubewell water is not suitable for drinking	
10. Electric supply	i) Leakage/shock	
	ii) Loss of insulation	
	iii) Improper performance of fans and fittings	
	iv) Earth continuity test failed	
	v) Earth electrode resistance test failed	
	vi) Lightning protection test exceeds ten ohms	

ANNEXURE 6.1

Performance Requirements and Corresponding Technical Specifications

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) (2)	Design Criteria/Technical Specifications critical for performance (i.e. how to achieve) (3)
Rooms	i) Provide convenient working/ dwelling space (including space for construction, servicing and maintenance) based on ergonomics (IS-5535), groups of activities, anticipated! furniture, equipment and storage (Minimum is as per per local bye - laws, National Building code and Indian standards).	i) A building is designed for a specific purpose. The first step in planning is to decide how this can be performed. The next step is to allocate space according to the specific functions, such as the living area, the service area and the sleeping area. These are subdivided into rooms. Each room or unit is related to a basic indivisible spatial requirement. It satisfies a group of basic functions which are closely linked and cannot be separated. (The minimum space in the drawing room for seating four persons in a sofa set is 2.30 metres by 3.00 metres. With passage, the minimum size is 3.00 metres by 3.00 metres. For six persons, the minimum size is 3.75 metres by 3.00 metres. The minimum space for dining of four persons is 1.20 metres by 1.70 metres. With passage the minimum size is 1.90. metres by 1.70 metres. The desirable minimum is is 2.00 metres by 2.00 metres. For six persons, the minimum 2.00 metres by 2.30 metres. However, in a hot and humid climate, the desirable minimum size of a living room is 9.00 square metres.) Living areas are where most of the living takes place. Often a living room is the only area a visitor knows of the house. Thus it should be inviting, spacious and comfortable. The space

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		for a divan (for a guest to relax, particularly for siesta) is welcome.
		Room size depends on the size and layout of furniture. These depend on the type and sequence of work (represented by a circulation diagram). Example - A layout of the kitchen follows the work sequence of storage of ingredients, preparation, cooking, temporary storage of food before consumption, storage of excess food and cleaning of utensils and crockery and their storage.
Cupboards	Provide adequate storage facility.	Built-in furniture, being adjacent to a wall, saves space. A built- in book-shelf saves floor space.
		Wall to wall storage is more economical than a store room occupying more floor space.
		(For storage and wardrobe closets : Depth- Min. 60cm., Max. 75 cm. Wall Closets :Depth - 45 cm, to maximise floor space for other uses).
Partitions	i) Provide for flexibility of use and need for possible expansion and improvement in future.	Provide modular space and furniture. For dimensions of standard furniture, fixtures and their layout (eg. minimum space to pass side ways=30cm.) consult time saver standards. (Minimum space required for sitting is 60 cm X 60 cm, for relaxing 75 X 140 cm and for sleeping 100 X 200cm).
	ii) Planning efficiency (i.e. proportion of working area) be as high as possible. However, it should not be at the cost of comfort, convenience or aesthetics.	Instead of a rigid norm, specify a range for planning efficiency to provide for flexibility of design. Evaluate alternative designs with reference to super ordinate goals for the project, through cost benefit analysis.
	iii) The trend is for more open and easy relationship in working, while maintaining individuality and freedom in privacy. With growing	The trend is towards an open office concept. In a residence, individual bedrooms with attached bath rooms is the trend towards the future.

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	tension in the society people need a more relaxed environment at home.	
Passage	Telecommunication has greatly reduced commuting between work places. Provide for passage without undue disturbance.	Minimum width for passage equals two unit widths, each 55 cm wide to allow a person to pass by another. Minimum passage for serving with tray etc. is 75 cm. While desirable width is 90 cm.
Entrance	The entrance should be inviting.	A patio is a courtyard, enclosed on one or more sides, it serves as an outdoor living area. The recreation room should be adjacent to the patio, overlooking the lawn, garden or the swimming pool. A pool (with a waterfall), integrated into the patio enlivens the environment. (For approach of a car, the width of a car track is 2.70 metres. The inside and outside turning radii are 5.50 and 9.00 metres respectively. Min. width of stair is 90 cm. Min. tread is 23 cm. Min. riseMax. Tread is 28 cm. Max. rise 20 cm. Min. width of landing = Width of door (swing) plus 8 cm. Min. head room vertical = 2.00 metres. perpendicular = 1.50 metres).
Facilities (on site)	Provide landscape and facilities on site to be in harmony with the physical and cultural environment. Activities outside the building are as important as those inside.	Design the landscape and all the site and the public amenities according to professional standards.
Landscape	i) It should be visually pleasing (providing a beautiful setting for the building), functional (as an extension of the living space) and easy to maintain. As a living structure, landscape must change (e.g. with change in seasons) and be flexible. It must cater to the	i) A landscape with plants, creepers, shrubs, lawn and the sound of flowing or falling water is a visual treat and is very soothing. It provides an outdoor living space. A water body, continous hedges and flower

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	predominant need of the residents and match their lifestyle.	beds provide 'unity' to the landscape garden. Repetition in a pattern provides harmony, sequence and balance. First impression lasts long. Seasonal flowers, birds and fishes (in lily - ponds) bring life and motion into the environments. Provide a focal interest (e.g. a rare colourful plant, a mound, steeped plants or a garden gazebo).
	ii) Provide a sustainable natural landscape.	ii) Take advantage of natural ground terrain. Do not attempt to remove the right colour combination and proportion of plants (through the different seasons). It is the most important design criteria. It depends on the characteristics of the plants.
Garden path	It should unfold the beauty of the garden as one strolls along. While providing contrast, the colour should match the natural beauty.	Earthy colours of bricks and stones are ideally suited for landscape.
Garden	i) High cost of urban land means less of kitchen garden (to provide for immediate supply only) and more of pleasure garden. The house and the garden must blend into a whole.	Area of a kitchen garden is limited to 10 or 15 per cent and for flowering plants and shrubs it is 25 per cent. Delicate flowering plants and pretty coloured leaves on the verandah link the house with the garden. Similar is the role of creepers and flowers beds adjacent to walls. (A 15 centimetres wide strip of soil adjacent to the walls needs water proofing to prevent dampness in walls). Sunlight in the morning is vital for flowers.
	ii) The garden must fulfil its purpose to give a feeling of the countryside by merging with the surrounding or Provide a feast to the eyes and for outdoor entertainment for the guests	Provide an informal garden to match the natural ground cover. Example: English style garden. In the Italian style, a fountain in combination with coloured lights, stone sculptures, decorative urns, and low bending trees help to present an enchanting view

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	or Provide rest and relaxation or	In the Japanese style, a composition of evergreen trees a lily pond, a stream of water and natural (uncut) stones present a serene setting.
	Be ethnic. or	The garden may conform to the most popular landscape gardens in the city (but not an imitation). Generally it is a combination of utility with beauty ... idea of heaven on earth. Examples : Persian and Mughal style gardens where cooling water flows and trees bear fruit.
	Be predominantly utilitarian. or	Provide a beautiful fruit garden.
	Provide a pleasant experience.	Consider user's requirement and tolerance of the locality to evolve a design considering the good points of the different styles. A common mistake is to fill the garden with too many varieties. It presents a view of overcrowding. It is against the nature to provide plants from the seaside, forest and the desert - all in the same garden. The narrow space between houses is not suitable for spreading trees, shrubs and decorative sculptures.
Hedges and screens (lattice covered with vines)	Let hedges and screens (lattice covered with vines) provide privacy and quiet and serve as sun and wind breakers.	Evergreen creepers on screens suitably placed (to provide shade in summer months only) are best. When planted at the boundaries such shrubs and creepers increase the surface covered area of the garden and also decrease the noise and air pollution.
Trees	Plant selected species of trees (in clumps if the layout is large) to create the appropriate back/fore ground and to provide privacy, colour and fragrance.	Compose the horizontal and vertical masses with the trees complementing the building masses. The type of soil and the climate determine whether the selected species survive and grow. Large trees and bird baths attract birds.

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Water bodies	Water bodies such as a lily ponds, streams, waterfalls and fountain heighten the beauty of the landscape.	A waterbody can be designed as a medium to unite the landscape by providing a focal interest. (A small pond with a fountain is ideal; the minimum depth is 25 cm. For a fish pond, the depth is at least 45 cm. Private swimming pools vary from 9m x 4.5m to 21m X 6m. For general swimming, a depth of 90cm is adequate.) Moving water gives a sense of activity, rhythm and life. Still water soothes the senses through the feeling of tranquillity. Reflections in the water, particularly in night light, are fascinating. Water plays an important part in spending the leisure time for rest and recreation.
Lawn	i) Lay out the lawn as a quiet corner to relax, to be in communion with nature and take out the stresses and strains of everyday life. It is the most decorative feature for a home.	i) The lawn covers at least 25 per cent of the area open to the sky. It requires sun light, a top soil rich in organic matter and regular watering.
	ii) Provide a large lawn. It enhances spaciousness.	ii) Garden paths, flower beds or fountain should not divide the lawn. Green hedges and fences merge with the lawn.
Exterior closure	Provide air and water tightness of exterior closure, including those of openable elements. Prevent the water vapour from reaching the reinforcement level.	Design for driving rain index, based on rain intensity and simultaneous wind velocity. For damp proofing and water proofing of a building, incorporate details as per IS 3076 and IS 13182. Use dense concrete in roof slab (tested as per IS 3085) with water proofing admixture as per IS 2645.
Roof	i) Prevent water stagnating on the roof.	Provide a smooth surface and uniform slope of 1 in 30 or in 40 (depending on maximum intensity of rain fall).

BASIC FUNCTION : Provide Working Space

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Roofing finish	ii) Prevent rain water seeping into the roof. (A rapid rainfall covers the roof s urface with a thin film of water which speeds up the runoff and reduces seeping. In a continuous drizzle, rain water seeps into the concrete and its micro-cracks).	Provide an integral finish over concrete in cement mortar 1:3 with waterproofing admixture (IS 2645). In addition, provide waterproof roofing finish, such as, lime terrace or silicon treatment. (Mere cement mortar is a temporary treatment, for a few years).
External walls	Prevent water vapour from reaching the inside surface. (It is seen that the direction of the rain is same as that of the prevailing wind).	Use dense and durable bricks or blocks for external walls, retaining walls and cladding. Water absorption should be within limits as per IS 7016.
External wall finish	In regions with prolonged rainfall, wall surfaces subject to rain beatings must be protected with plaster (in cement mortar 1:4 or 1:5) or with cladding so that rain water vapour is unable to reach the inside surface of the wall.	Though paints and cement mortar products are impermeable to water they cannot prevent passage of water vapour. However, they facilitate formation of a thin film of water on the surface to drain off the water, thus delaying ingress of water into the wall. Such a delay causes the water vapour to evaporate before reaching the inner surface. Rough-cast and pebble-dash finishes shed much of the water that falls on them.
Walls, floor	Prevent dampness on floor and walls.	i) Provide a damp proof course at plinth level (and underfloor, if below ground level) as a barrier against capillary action of ground water.
		ii) Limit water absorption by floor. It helps easy mopping and drying.
External doors, windows, ventilators	Allow light and air, but not water.	Use metal or chemically treated and seasoned timber (moisture content 10 to 12 per cent) with appropriate sealing of joints with glass to maintain water tightness (IS 287, 401, 1141, 11215,128, 12049).
External painting	i) Prevent warping and shrinkage due to moisture movement in timber. Entry of water is most likely through horizontal joints.	Many paint failure are due to the poor quality of primers. Use Indian standard (IS) marked or superior quality paints and primers. Paint the

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Thermal Comfort

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	ii) Prevent dampness due to point peeling off.	timber at a moisture content near to that at which it will stabilise (e.g. 15 to 18 per cent for exterior wood work).
Plumbing	Prevent leakage.	Provide durable pipes and fittings and leak proof joints.
Drainage	Prevent rain water stagnating over roof.	Provide at least one drain pipe for every 80 sqm. or part of roof area.
Landscape	i) Extremities of outside temperature variation are reduced by controlling the micro-climate through the design of the landscape. In hot and humid climate, minimise the incidence of solar radiation and maximise the evaporation of moisture by breeze.	Air temperature in a city can be 8°C higher than the nearby country-side. The temperature of an asphalt surface can rise to 44 degrees Celsius above surrounding air. Landscaping reduces the surface temperature. It is better to reduce solar radiation from reaching the building than design the outer shell to limit the rise in temperature. Design shading devices according to the Sun-path.
	ii) Air temperature near the ground depends on the type of the surface. In the afternoon, the temperature of ground is higher than air. Design the landscape to lower the maximum temperature around the building in summer and raise the minimum temperature in cold climate in winter by two or three degree Celsius	By re-radiating the heat outdoors, an external shading is 35% more efficient than an inside shade which partly radiates insides. Shading by landscape features such as a tree or jali greatly helps. Provide shading of the external walls subject to maximum heat or cold.
		Rate of evaporation increases if there is moisture (such as from grass or vegetation) or a water body. Evaporation cools the structure faster. The outer shell of a building acts as a balancing reservoir of heat to reduce peak temperature and delay the same.
	iii) Due to hostile outdoor conditions of hot and dry climate, even sitting out spaces need shelter from hot winds and solar radiation.	A higher level of ground floor ensures better breeze. A roof overhang protects the area beneath, from solar radiation and throws a long shadow

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Thermal Comfort

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	Incidentally it shelters the adjoining living rooms.	over adjacentareas. For every 30 cm. increase in room height upto the roof, reduction in room temperature is 0.3 Air flow is very effective in removing heat.degree Celsius only.
Building form and orientation	The environment consists of the climate, physical features (movable and immovable), living beings and the surrounding space. Work with the forces of nature – not against it. Design a climate-balanced building for human comfort and reduce the stresses in the structure. The landscape and building design must ensure that temperature inside the building are within the thermal comfortzones by lowering the summer day time temperature inside by five degrees Celsius and raise the winter day time temperature by eight degrees Celsius when compared with buildings (in extreme climate) not designed on environmental considerations (IS 3792 and IS 7662)	i) Orientation relates a building to its environment. ii) Roof overhangs and *chhajjas* should shade the windows in summer but not in winter. iii) Solar heat gain through walls should be minimum in summer and maximum in winter. Room orientation has greatest potential for energy efficiency and thermal comfort. Prioritise locations of rooms to match their functional requirements with the predominant wind, rain, and directions of sun rays during critical months. With large diurnal temperature variations. Thermal capacity is more effective than insulation. iii) Minimise conduction of heat through the exterior closure by controling the thermal transmittance i.e. U-value of the components. It delays the peak till evening . It helps to keep the temperature inside lower than the peak temperature outside.
Windows and ventilators	i) Basic factors affecting human comfort are solar radiation, humidity, ventilation and glare. Design windows to control these. Greatest source of heat gain is through the windows due to thermal and radiation. ii) The minimum permissible shading coefficient (proportion of solar radiation transmitted) by windows in hot climate is 0.5	i) While providing adequate daylight, sizes of the windows should besmall to limit temperature inside to 37 degrees Celsius and wet bulb temperature of 34 degrees Celsius. Wooden window shutters when closed reduce the heat inflow during the hottest part of a day. ii) Shading coefficient of 0.5 can be achieved by using single glass windows with venetian blinds or heavy curtain behind (or with

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Thermal Comfort

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		double glazing, if adequate light requires a large window). Walls facing west should have minimum window areas with glass. Less severe is this restriction for windows facing East. Walls with very large glass areas should face nearly South/North (depending on latitude/prevailing wind direction during critical months)
	iii) Eliminate hot or cold draught feeling near the inside wall surface adjacent to the window.	Locate the window away from adjacent wall surface and provide low emissivity wall finish.
	iv) Cool by ventilation (fresh air/wind) when indoor temperature is higher than outdoor	While surface conduction (heat exchange at surface) for white painted walls and roofs are 8.3 watts per m^2 per degree kelvin and 6.1 watts per m^2 k in still air, it is 22.7 watts per m^2 k in moving air. Thus ventilators cool the roof slab faster.
Roof	i) Reduce absorption of solar radiation and provide for faster cooling of roof.	Thermal resistance of an unventilated cavity equals that of 180 mm. thick brick wall.
	ii) The rate of heat flow through a construction depends on the product of absorption of solar radiation (a) and the thermal transmittance (U). Limit the product to 0.8 for a warm humid climate and 0.6 for a hot dry weather.	White colour and bright metal surfaces reflect most of the radiation thus lowering absorption. A surface with higher emissivity (e.g. white painted) cools faster than metals (low emissicity). Provide openings in parapet for breeze (even if warm) to take away heat. White washing or while painting of the roof provides higher emission. A sloped roof avoids normal incidence of Sun's rays at a time when outside temperature is high. It provides greater surface area for cooling and more volume per person. Hence it is suitable for hot and humid climate.

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Thermal Comfort

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	iii) Reduce thermal transmittance (including the effect of surface resistance) inside to reduce the peak temperature and delay it. Limit thermal transmittance through the roof (U-value) to 2.33 watts per sq.m. per degree celsius.	In a hot climate, provide heat insulation on roof with mud phuska, lime terrace or proprietary water proofing (depending on rainfall) so that thermal transmittance is limited to that through a solid total thickness of 23 cm. Hollow slabs or waffle slabs, with bottom covered, reduce the peak inside temperature.
	iv) (If required) provide insulation to lower indoor temperature.	Provision of insulation on the roof instead of under it is far better. It reduces the peak inside air temperature greatly. (Insulation is provided under the roof when air condition is provided).
Sunshade and jali	In summer, avoid direct sunlight into the rooms.	Sunshades and jali while providing privacy may also be designed as shading and wind barrier devices. Light weight and bright coloured shading devices reflect back as much of sunlight as possible.
	i) Reduce absorption of solar heat due to radiation.	
External wall		White colour reflects solar radiation to the maximum (Bright metal surfaces have low emissivity and thus attain much higher temperature).
	ii) Increase emission of absorbed heat.	Provide a textured outer surface of the walls to increase the surface area thus allowing the wall to cool down faster at night. However, in a contaminated atmosphere, a smooth finish is best.
	iii) Limit thermal transmittance through walls (U-value) to 2.56 watts per sq.m. per degree Celsius in hot climate and 2.91 watts per sq.m. per degree celsius in warm humid climate.	
Curtains and blinds	Reduce heat gain due to direct solar radiation.	Curtains/blinds are not very effective since the absorbed heat is reradiated inside also. By eliminating unwanted sunshine, curtains and blinds reduce the heat gain by 17 per cent only.

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Fresh air (Control air flow)

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
False ceiling	Reduce thermal transmittance to reduce the peak temperature inside and delay it.	A cavity below the roof reduces the peak inside temperature greatly and delays the same.
Floor	It should be comfortable to walk barefoot and for children to play on the floor	Limit thermal conductivity of the floor. Higher emissivity means faster cooling.
Doors, Windows, Ventilator	i) Wind velocity in a built-up locality is less than half of that in the adjoining open country. Regulate airflow according to the weather.	i) Trees, with foliage above the top level of window but no foliage below, deflect the wind downwards. It improves ventilation.
	ii) At moderate humidity (35 to 60%), effective temperature is significantly lowered by wind velocity.	ii) Orient the building to face the prevailing wind direction (as indicated in IS 7662). A variation upto 30 degrees has no significant effect.
	iii) Provide ventilation according to National Building Code and IS 3362 or IS 3013 and regulate air flow according to weather condition.	iii) The basic purpose of a window is to admit light and air and provide a pleasant view of outside. Thus it is the most important building component helping the inhabitants to control the interior environment of the building despite changes in the external environment due to weather, traffic, etc. Regulate area of window opening by adjusting the position of window shutter (partly open) with adjustable (length of) stay.
	iv) In a dry climate, preventdraught of hot or very cold air over body. The area of window opening is limited to provide minimum air change but adequate day light.	iv) Window sill level is kept higher. Control air flow by suitably locating the windows and limit the window openings to about 10 to 15 per cent of the floor area.
	v) In warm and humid climate, orient the building to face the prevailing wind direction. Variation upto 30 degrees Celsius has no significant effect (IS 7662).	v) Provide adequate cross ventilation with window openings of about 15 to 20 per cent of the floor area. Provide windows on opposite walls and across the wind. It limits the reduction in wind velocity inside upto 15% (depending on the position of the window).

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Light but Control Glare

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Fresh air fans and coolers	Provide requisite air change for thermal comfort (e.g.for kitchen, at least 57 cu.m per hour) by removing the excess heat of air inside a building and the excess heat produced by human body. The latter depends on the type of activity and varies from 70 watts while sleeping to 600 watts for sustained hard work. A person in a business dress needs air temperature nine degree Celsius lower than for a naked body.	Provide fresh air fans at the rate of one per 9 sqm (small fans or 10 sqm to supplement ventilation due to windows and ventilators Coolers are effective in hot and dry climate/season. Ceiling fans merely provide air movement for physiological cooling in a warm humid weather.
	Heat loss from the body is due to radiation, convection and evaporation in the proportion 2:2:1. The ratios vary with temperature, humidity air movement.	If the (dry bulb) temperature is above 36 degrees Celsius and the relative humidity is less than 50 percent, it is too dry and hot to be cooled by wind alone. Evaporative cooling (with moisture ture spraying cooler) is necessary. Shading is needed when the air temperature is more than 24 degrees Celsius.
	Special attention is required for areas likely to cause maximum discomfort.	Since a kitchen requires, more air change without any draught, provide a reversible fresh air exhaust fan or at least a high level ventilator with an effective opening area of at least 3500 sq.mm.
		Provide reversible (fresh air & exhaust) fans in bathrooms and toilets in confined locations or with excessive use.
Landscape	Glare is due to violent contrast in light in the field of view. Avoid it.	Trees reduce glare.
Windows and Ventilators	Provide much of the day light from indirect light in the room due to reflectance of the ceiling, walls and the floor.	Control the orientation and design of openings in relation to the sun and wind as per IS 7662 and is 2440. In tropics, adequate day light is assured except when in shade, at least 2% for kitchen hall structure :

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Illumination without Glare

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		1% for living rooms and 0.5%. for bedrooms. (With reference to brightness of perfect white as 100% and black as 0% , the brightness of three primary colours deep red, blue and yellow are 10,15 and 50 per cent and for lime white 80%. For the three mixed colours, violet (red-blue), green (blue-yellow) and orange (yellow-red) the values are 5,20 and 30 per cent respectively. Lighter shades like cream, golden and light blue have 70, 60 and 50 per cent brightness.)
Sunshades and Jali	Control glare as per IS 3646. Glare occurs when some parts of the field of view are excessively bright, in to the background.	Appropriately designed sunshades minimise direct sun-light (i.e.skyfactor).To avoid excessive light on a part of the viewing surface, light should preferably come from windows on adjacent walls. Screen, jali and louvres diffuse the
Curtains	Avoid glare.	Blinds and curtains best eliminate unwanted sunshine and glare and attention is drawn to important areas and detailsare luminaries seen accurately.
Lights and luminaries	i) Provide for brightness and colours pattern so that attention is drawn to important areas and details are seen accurately. ii) Provide illuminanace (including daylighting as per National Building code and IS 3654 Minimum light (lumens/ sq. mtr) / Maximum Glare Index Subdued lighting 50 — Clear visibility 100 —	Design to use natural lighting and ventilation to the maximum. In the circulation diagram showing, interrelation of work places, indicate the illumination required at workplace. Determine accurate the background and spot lighting requirements. Provide a dimmer switch to reduce the level of illumination since a single source of light produces shadow. Provide light plug points at suitable locations for sustained reading or accent lighting.

BASIC FUNCTION : 3 Control Environment
SUB FUNCTION : Provide Light but Control Glare

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	Casual reading 150 —	
	Sustained reading 300 19	
	Visually critical work 300 16	
	iii Avoid direct light in the field of view. Provide diffused and reflected form of general room lighting, limiting the glare index.	Provide luminnairs for lamps and louvred diffuse for fluorescent lamps. Controlled lighting can enhance th. decor of the dining room.
	iv) Avoid shadows - particularly on working areas.	For decorative and mood lighting, reflective lights with dimmer switches can set the tone. (Example: light from sky light greatly enhances bathroom environment).
	v) Provide colour rendition and mood lighting	For accent lighting of sculptures etc ., use a crown silvered blown glass lamp with an external reflector.
Services	i) Easy operation of utilities is the key to comfort. However, it should not be at the cost of good aesthetics.	Refer time-saver-standards for comfortable layouts.
	ii) Provide flexibility of rearrangement.	A modular layout provides flexibility. Movable cupboards placed adjacent to thin partition walls provide flexibility.
	iii) A service or a layout that is a luxury today may become a comfort in the foreseeable future. The infrastructure for such services must be provided initially, though the fittings may come later.	Provide infrastructure and layout for future services such as outlets for communication, computing, television and music.
	iv) To provide comfort and privacy, but cost permitting, each bedroom be provided with an attached bathroom. The bathroom does become functionally an extension of the bedroom for relaxation to soothe the nerves. It becomes a sanctuary where the mind and the body are refreshed.	Instead of standard 1.5 m by 2.4m bathroom with a toilet, bathtub, shower and wash basin, other amenities may also be provided since the additional benefit-to cost ratio is very high.

BASIC FUNCTION : 4 Add Comfort

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Finishing	To take out the tedium of house keeping, minimise the effort required for operation, maintenance and up-keep.	Use permanent and maintenance free materials for finishing.
Fixture and fittings	i) Layout should be consistent with ergonomics and lifestyle of users.	Type layout and sizes should conform to Indian standards and be appropriate for the lifestyle. Reference may be made to Time Standards. Example: Heavy duty fittings are provided in low income housing since fittings are few).
	ii) Minimise the effort required for operation.	Example : Provide a single location switch to operate all the points in the room and also to control the level of light. Alternative switches may be provided for operation at critical times such as at bed time.
	iii) Obsolescence relates more to fixtures than to the building itself. Thus provide flexibility for replacement.	Provide replaceable fittings and fixtures.
External doors, windows	Prevent insect nuisance.	Use a paint with insecticide (such as Vinycide)
	Prevent insects, termites and fungus attack and moisture absorption by wood.	Provide anti-termite treatment (IS-6313).
		Use chemically treated and seasoned timber shutters (IS 401 and IS 1141) limiting the moisture content (IS 287) or use pressed steel or aluminium windows.
		Use metal or hard wood frames. Even small areas of teakwood sap need to be treated. In joinery, entry of water is most likely at joints near horizontal surfaces. Provide water-tight and durable joints.
		A single coat of primer does not give adequate protection if exposed for long. Sapwood cannot economically be excluded completely. It must be treated with a preservative.

BASIC FUNCTION : 5 Maintain Cleanlines

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Landscape	Limit the dust and smoke by suitable landscape and screening devices	Tree leaves catch dust. Air through a tree is filtered.
Work area	Keep work areas smooth, neat, clean and physically separate from areas of waste collection and disposal.	i) Provide a twin tub sink in the kitchen. ii) If aesthetics matter, provide a polymer marble or a granite sink instead of a stainless steel sink to reduce noise.
Floor	i) It should be easy to clean and keep dry.	Lower the level by 25 cm of floors which need to be washed (as kitchen, bath, water closet and balcony) and provide a slope of 2.5. cm towards the floor trap. For wet areas provide special leak proof floors and joints.
	ii) It should be easy to notice dust and dirt.	Reflectance helps to see the dirt for cleaning. A water proof and scratch resistant floor (checked with a penknife) prevents the floor from being dirty.
	iii) The floor should be non-skid, dust free and so clean as to allow walking barefoot and for babies to play on the floor.	The floor should be hard, smooth, antistatic and quick drying. Thus water absorption (affecting strength and durability) and abrasion should conform to the limits as per Indian standards. In the case of a stone flooring, scratching with a pen knife should not make a visible impression (IS 1122, 1124, 1726).
Cupboards	Provide adequate storage to avoid clutter.	Provide for storage near the place of use. The type of storage depends on the reason for storage. Avoid sliding doors (to prevent entry of moisture, dust and insects). A cupboard upto ceiling height provides adequate and economical storage.
Water Supply	i) Tube well water must be treated before it mixes with potable water supply. Prevent mix up of potable	Water must conform to IS 1172 and IS 2065. Provide a physical

BASIC FUNCTION : 5 Maintain Cleanliness
SUB FUNCTION : Provide Drainage of Rain water and Sewage

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	and non-potable (unfiltered) water and with waste water.	disconnection (i.e. air gap) between inlet of clean water and outlet of waste water. Drinking water outlet should not be provided in bathrooms and toilets.
	ii) Prevent leakage.	ii) Provide leak proof joints (IS 4346) and durable pipes and fittings
Rain water pipes	Prevent blockage.	Do not connect a rain water drain pipe to a sewerage pipe, except through a gully trap. It should discharge into an open drain and at a sufficient height to prevent back flow or blockage.
Drain	Prevent water stagnating or overflowing	Design for maximum intensity of rainfall likely to occur in a 'wet' year. Minimum slope at the invert level is 1 in 600. Narrow and deep drains are suitable for a flat ground. The system is designed for maximum rain fall in any 24 hours duration.
Sewers	Prevent stagnation or sewage decomposition	Provide correct sizes of pipes and correct invert levels.
Sanitary fixtures	i) Prevent foul smell in the vicinity of sanitary appliances	Ensure at least 5 cm depth of water seal for water closets and floor traps and 7.5 cm for other fixtures. Provide a vent pipe to limit pressure fluctuations which may cause failure of water seal.
	ii) Provide smooth anti-corrosive and sanitary quality plumbing and fixtures for convenience in cleaning.	Conform to IS 1172 and IS 1742.
	iii) Prevent blockage	Provide a floor trap on the kitchen floor and an intercepting and inspection chamber at the outlet of the pipe before it meets with the soil pipe. It helps to intercept the grease stuff which may cause clogging of pipes and sewage backflow.
	iv) Ensure adequate pressure of water at the inlet of plumbing fixtures.	Minimum water pressure for flushing is as follows:

BASIC FUNCTION : 5 Maintain Cleanlines
SUB FUNCTION : Remove waste

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		Wall hung W.C - 25 psi (172 kpa) European W.C - 15 psi (103 kpa) with a flushometer valve at other fixtures 8 p.si (55 kpa) with a flushomete value.
	v) Remove foul smell and ensure adequate	Provide fresh air cum exhaust fans in kitchen bath and water closet supply of fresh air. areas.
Sewage pipes	i) Prevent leakage of foul smell from sewerage pipes.	Sanitary pipe work must conform to IS 5329. When connected to soil pipes, waste pipes from floor traps should be connected at least 20 cm. above the connection from water closets at that floor. Spigot and socket joints should be airtight. Lead joints should be free from blow holes.
	ii) Wastes should be carried away quickly, quietly and smoothly without blockage.	Prevent backflow. For smooth flow of discharge from water closets-minimum dia of pipe and trap is 75/100 mm, minimum dia of vent pipe is 50mm while that of waste pipe 75mm. Ensure that the ventilation cowl remains in position.
	iii) Prevent foul smells due to clogging from deposits and eventual backflow of sewage.	Provide for smooth flow and easy cleaning. Prevent entry of objectionable matter by providing grease trap and intercepter for kitchen waste. Design for velocity of flow of at least 1.2m per second for scouring action while conveying maximum discharge.
	iv) Water proof wet areas to prevent seepage.	Water proof the sunk floor area accommodating the Indian type water closet by providing 400 micron thick P.V.C. over blown residual bitumen applied hot. Conform to IS 1172 and IS 1742 .

BASIC FUNCTION : 6 Provide safety
SUB FUNCTION : Transmit Load

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Structure	i) Prevent development of cracks due to differential settlement.	Moisture impurity of materials and imperfect construction contributes greatly to loss of strength and durability. Use IS marked or superior materials.
	ii) Provide adequate strength and stability for safety from imposed loads as per IS 875.	A building component is as strong as the weakest link. Strength and other criteria for acceptance may be specified as per IS codes (e.g. IS 456 and IS 4326) Sizes of members may be fixed based on criteria for preliminary design. Openings in floor and walls must be carefully located as per IS 4912.
	iii) Prevent development of cracks	Design as per IS 1597, 1905, 2202, and detail as per IS 3067 to exclude rain water and allow thermal and moisture movement. Prevent development of cracks in walls. Closely spaced openings should be provided with a continuous lintel. Prevent saturation of brick wall behind external plaster as it may crack due to moisture movement or expansion (0.04 to 0.12 per cent) which may be aggravated due to thermal movement of roof (0.012 per cent per degree Celsius).
	iv) Prevent corrosion of reinforcement, plumbing and fixtures (IS 9077)	Provide adequate cover to reinforcement and test water to be used for construction (IS 456, 3025)
	v) Provide safety from the effect of earthquake.	Load bearing construction must conform to IS 4326. In addition, RC structures must be designed as per IS 1893.
Foundation	i) Transmit the load to the ground safely and economically.	i) Spread footing are the most economical (as shown in fig 11.1). ii) Design the foundation for equal settlement and safe bearing capacity of soil (IS 1904, 6403, 8009) and

BASIC FUNCTION : 6 Provide safety
SUB FUNCTION : Provide safety from Fire and Electric Shock

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		provide foundation as per IS 1080, 1085, 2911, or 13094 as the case may be. If the foundation cannot be supported on the same type of soil throughout (even with the deeper excavation at places) provide re-inforced concrete strips or footing.
Building	i) Provide safety from lightning.	Provide lightning conductor as per IS 3070.
	ii) Reduce the risk of outbreak of fire and its spread by reduction in fireload and provision of first-aid fire fighting equipment.	Use fire resistant materials and provide adequate cover. Design and construction must conform to the provision in local bye-laws, National Building Code (Part IV) and IS 1641,1642,1644,1646, 3808, 3809, 3844 and 12777.
Water supply and plumbing	Assure adequate water supply for fire fighting. Maintain strength of plumbing during and after fire in the building.	Provide water supply as per IS 3844 Plumbing must be fire and corrosion resistant. P.V.C pipes are unsuitable for water supply, since such pipes melt in case of the fire.
Doors	Contain fire to limit the damage.	To prevent the fire from spreading, provide half an hour fire rating of doors by fire check doors. If required, provide fire rating of an hour's duration
Electrical installation	Protect persons and equipment according to the provisions in IS 3553	i) Building line must be at least 1.2 metres away from over-head supply line. In case of high voltage line (more than 11 KV), minimum distance is 2.0 metres. Provide electric installations as per IS 1646, IS 3016 and IS 5216.
Electrical installation	Prevent fire and/or damage due to short circuit or ground fault.	ii) Provide earthing of all electrical equipment and wiring as per IS 3043 to eliminate the occurrence of dangerous excessive voltage due to lightning, line surge and accidental contact with lines of higher voltage. Provide electrical wiring as per IS 732.

BASIC FUNCTION : 6 Provide safety
SUB FUNCTION : Provide safety from Fire and Electric Shock

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		iii) Provide a ground fault circuit interrupter for outlets in wet locations
		iv) Provide water tight electric light fitting. Each socket is of 3 pin type and is controlled by a switch. It is secured by connecting the earth terminal to the plug and the body of the current consuming device. Each 15 ampere socket is provided with its own fuse. All lamps and fans are hung with the bottom most part at a height of 2.4 m. above the floor. The conducting wire for lighting is not less than 1.00 sq.mm. copper wire or 1.5 sq.mm aluminium wire. for power it should be at least 4.00 sq.mm. Rigid P.V.C conduits should be avoided in locations where the ambient temperature is above 50 degree Celsius. Earth continuity connection (earthing connected with current carrying conductor i.e. system.
		earthing) improves service continuity and prevents damage to persons and equipment. This is provided by the metallic conduits and metal fastnings touching the earth. It is supplemented by an earth continuity conducting wire run with the cables. To avoid shock, the earth wire shall as far as possible, be out of the reach of a person.
		Conform to fire safety requirements as per IS 1642 and for protection of cables as per IS 12459. All exposed metallic surfaces associated with electric systems must be grounded as per IS. Provide Miniature Circuit Breakers so that persons, equipment and insulation are protected by the switch tripping promptly. Ensure coordination so that in fault

BASIC FUNCTION : 6 Provide safety
SUB FUNCTION : Provide safety from Fire and Electric Shock

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		condition, only the defective portion of the system is automatically disconnected, causing least disturbance to other parts.
Fire detection	Provide system reliability, and fire fighting	Use wiring and equipment below the rated maximum level. Provide portable first aid fire extinguishers as per IS 2190 and IS 11108.
		For supply in excess of 200 ampere, a switch board with circuit breakers is preferred.
		Provide a fire detection system as per IS 2175, IS 2198 and IS 11360.
		Provide fire fighting equipment as per IS 942 and IS 3844.
Electronic equipment	Protect sensitive electronic equipment.	Proper grounding of electronic equipment is ensured to reduce problems of electro magnetic interference. The latter is caused by motor starting, electronic discharge lighting (such as fluorescent lamps), operation of switches and contactors, circuit breakers, relays and circuit faults. Physical separation of electric power controls and communication lines is most effective to control interference.
		Earth electrodes are provided at sub-stations, generating stations and at the building premises. Resistance of the earth system should not be more than five ohms. It depends on the electrical resistance of the soil. Use of similar material for earth electrodes and earth conductors is desirable.
Landscape	Reduce noise and provide a pleasant environment. Unacceptably high noises due to heavy vehicle traffic within 30 metres distance	A barrier at line of sight is effective. Plants, trees and foliage reduce noise upto ten decibels and invite birds to provide a pleasant environment.

BASIC FUNCTION : 7 **Provide Privacy and Control Noise**

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	from the living area. Starting of a heavy vehicle (e.g. at a traffic signal within a distance of 240 metres) increases the noise five-fold.	-
External Door, Windows	i) While the noise level from highway traffic is85 decibels and on main roads 75 decibels, that from a noisy kitchen or W.C. flushing is 100 decibels. The recommended maximum indoor sound level is 45 decibels in day time, 35 decibels at night time and 25 decibels in sleeping area. Provide adequate sound insulation if external noise in the environment is above 45 decibels. ii) If a road with a heavy vehicle traffic is within 45 metres or a railway line or a stop signal for heavy vehicle traffic is within half-a-kilometre distance and the line of sight is clear, the sound level is unacceptable. Even shielding does not reduce the disturbance. If the night time traffic consists of	i) Ensure sound insulation as per IS 1950 and IS 4954. A smooth solid wall reflects 98 per cent of approaching sound. Of the transmitted sound, insulation is proportional to the weight per unit area. A single brick thick wall with plaster (with a noise reduction of about 50 decibels) is generally adequate. However, sound insulation depends on the weakest path. ii) A closed but openable window provides sound insulation of 20 decibels only. If the environmental noise is more than 45 decibels provide windows with double glasses. Window with an air gap gives an insulation of 35 decibels. Materials which absorb sound also allow it to pass through easily and hence are poor insulators. Fibrous and porous materials with inter connected pores are good sound insulators.
Rooms	i) Provide sound insulation from adjacent rooms. Clearly audible sound (ticking of a clock or whisper) measures 20 decibels. Sound insulation with adequate privacy can be provided by a single-brick-thick wall or separation by two closed doors with an intervening hall or a corridor. Sound insulation with inadequate privacy is equivalent to that of a half-brick thick wall	The European water closet in the bathroom attached to the bedroom is also used as a urinal. Thus the cistern should have adjustable water content control to minimise disturbance due to the sound of flushing.

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	(i.e. 45 decibels) or a closed door. A sound signal of seven decibels above the background noise level is clearly audible.	
	ii) Obstruct the line of sight for privacy.	Provide high level windows for bathrooms Group rooms of similar activities together. Sle.ping areas should not face the road with heavy vehicle. Sound insulation of 40 decibel is necessary to prevent hushed conversation in bed-room from being heard outside. It is equivalent to the sound insulation of a half-brick-thick wall. For normal conversation, the sound insulation must equal that for a single brick-thick-wall.
Architectural Style	i) Provide an appropriate style of architecture to enrich the quality of life. A home or a workarea must be a place, where it is nice to be. To accentuate the joy of living provide a lively interior and an impressive landscape outside. Areas in shade outside a house are as enjoyable as inside. The basic purpose of a house is to allow a family to live together and communicate in a relaxed environment and postures. Aesthetics must take ergonomics into consideration, but make allowance for regional variations in cultural, physiological and psychological aspects. Aesthetic design must convey the purpose and the level of success achieved when viewed against the aforesaid criteria. The key to success is not to expect human beings to adapt to the devices but vice versa.	Just as architectural styles of the past reflect the culture of the past, a style of the present reflects the current living habits and future needs. The oriental style is characterised by the requirements of the joint family and the climate. Typical examples include a courtyard, wide verandahs and a sloping roof. The western influence lays emphasis on individual family apartment, bedroom with attached bathrooms and a flat roof. Organic architecture (such as by Frank Lloyd Wright) unifies the building, its interior (including the furniture and other utilities) and the landscape. The approach is completely different from the traditional concept of designing each room for a specification. It avoids the emotional strain caused by uninteresting box like rooms and buildings.

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Architectural Style	Architecture must enhance the environment and be enriched by it.	The design of a residential building and its environment evolves out of the understanding of the nature of family life. The emphasis is on multipurpose areas with a few partition walls carefully designed and placed to provide privacy. The landscape is designed as an extension of the living space inside the building. Thus the effects of the wind, sun, moon, and star sights on the environment become essential criteria for design of the building and its landscape. Garden gazebos/verandahs with transparent/translucent roof/pergolas effectively extend living space into the garden. Cantilevers excite visual perception and generate spaces sheltered from rain and sun while retaining the beneficial effects (such as openness and diffused light).
	ii) The form of an object conveys a message through visual communication and affects its interpretation. Thus it evokes the viewer's emotion and reaction. While form must evolve out of function, provide aesthetic embellishment to make the form graceful and attract attention. Every building must have a unique character and personality to effectively communicate how it meets the individual's needs. Architectural style must be appropriate and convincing-not merely to get applause, but to plan for a larger vision or purpose and of the details to hold the vision together.	To be aesthetic and economical, a structure should be true to form and purpose and realise the inherent strength of the form by allowing the stress to flow as it naturally would. The architectural style of a building is viewed mostly by the design of its elevation. Due to partitions, the plan is not visible in one go. The plan merely assigns the horizontal dimensions. Even with the same plan, a completely different elevation is possible — by different vertical dimensions to the building components and their relative position. Balance (symmetry) in elevation is achieved through mass, texture, colour and patterns of light and shadow. The elevation should appear as one whole and have some point of emphasis.

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		The monotony due to universal use of rectangular shapes may be broken by selective addition of other shapes. Curves are graceful, but not in excess. The architectural style should be contemporary and futuristic and reflect the individuality and character of the building.
		Sizes and shapes in conformity with the proportions found in nature are most pleasing due to our familiarity with them. For rectangular shapes, the ratio of breadth -to- length should preferably consists of successive numbers of Fabionacci series such as 1/2, 2/3, 3/5, 8/13 etc.
	iii) Visual perception depends on the contrast of a figure with its background. Contrast creates visual excitement and attracts attention. Harmony, characterised by agreement, gives a soothing effect and mental comfort.	Natural colour and texture of materials can be exciting. Quality of a colour is characterised by its hue value (i.e. lightness or darkness) and intensity (i.e. saturation). Intense colours appear closer as are light hues and tints.
		Red, blue and yellow are primary colours evoking the feelings of hot, cool and joy respectively. A colour scheme of these colours alone is not exciting. Orange colour is a mixture of red and yellow and is associated with feeling of warmth. Green is the mixture of blue and yellow, it is soothing. Violet is the mixture of red and blue.
	iv) We trend to make a meaning out of what we see. Ambiguity creates uneasiness, such as when the composition is neither with contrast nor with harmony.	According to Munshell's circular chart, red, yellow, green, blue, and purple are equally spaced around the circle. Adjacent colours produce harmony and opposite ones contrast. Cool colours are suitable for rooms with maximum sunlight and warm colours for minimum.

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Building	Provide aesthetic design.	Aesthetic design involves six basic elements and their combinations. These are form (shape), space (volume) light and shadow, colour, texture (material and finish) and lines and levels (hint of movement). Bold colours tend to advance, pale colours tend to recede. Six basic principles of design are variety, unity (wholeness),in variety proportion balance and character, repetition, rhythm (regular sequence) and emphasis (focus to draw attention).
	Being at eye level, visible cracks upto 5 mm width greatly affect the aesthetic value of the building though these may not affect the safety of the building, if non-recurring or non-progressive. These are generally due to differential thermal and/or foundation movement not properly catered due to poor design detail and/or workmanship.	Assess differential movements and provide for the same through proper design detail and workmanship. Cracks upto 1mm wide are rarely visible after removal of plaster. Non-recurring cracks can be replastered or bonded. Such cracks in external walls allow seepage of rain water.
Doors windows	Being at eye-level and in close contact with the user doors, windows and grills greatly affect the user's perception of aesthetic beauty. Windows provide the view of the outside world ; such a view must look like a picture, properly framed.	Instead of being an obstruction to the view, the window grill must embellish it. While a plain window grill costs one percent of total cost, a decorative grill costs only 0.5 per cent extra.
External finish	i) Facade (i.e. face of a building) treatment enhances the personality of a building. A pleasing composition must attract the the viewers' attention and communicate the purpose of the building.	Too simple or organised a composition leaves nothing to interpretation and is uninteresting : so also an over- designed one. There is a limit. Until it is reached, it is not enough; after that is too much.

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		EXAMPLE : The singular smooth surface texture of a plaster is not amenable to a variety of finishes.
		A textured decorative exterior surface such as a pebble dash plaster can be a powerful medium of expression.
		Patterned and tooled stone finishes and exposed brick work provide variety.
	ii) Minimise the effect of aging as colour fading growth of fungus and hair-line cracks so as to preserve the personality and the image of the building.	Use superior quality materials and workmanship in finish. The finish must be anti-fungus weather resistant and free from hairline cracks. Use paints of non-fading coloursand based on saturation and luminosity considerations. Sand papering closes the wood vessels and rays by deformation of the cell walls. It reduces the consumption of paints. Yet it improves uniform spreading. Pride in doing the job well seems to be waning; provide for manufactured materials.
	iii) A regular surface pattern produces harmonious visual effect, but a symmetrically balanced composition can be boring. Asymmetrical balance attracts attention as it unites the composition. The use of pattern is now less rigid, more lyrical and subtly broken.	Manufactured products conform to rigid tolerance limits. For developing a pattern, these are better suited than an on-site construction. Many manufactured products imitate a natural material and provide an opportunity to give false finishes and create patterns which rarely occur in nature.
		Similarity of size, shape, colours, texture or orientation tends to group parts together—more than mere proximity. Texture can unify parts of a composition with dissimilar shapes.
		A skilled architect alone can design a good composition. Skilled workers

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
		only can provide true to form shape, colour and texture. Good quality materials are essential to maintain aesthetic quality for the full economic life of the component - especially of finishing, fittings and fixtures.
	iv) To provide harmony and character each building component such as a window should be so composed of its parts that it looks like a picture.	Forms evolved out of regular geometric shapes are pleasing. Workmanship (to produce perfect shapes with lines and levels within specified tolerance limits) is of immense importance (Tolerance in masonary for plumb and vertical alignment are 1cm. and 2cm. respectively. Tolerance for horizontal or vertical straightness of construction line is 6mm for a line of 6m. length. Tolerance for door hanging: maximum cup in top/bottom 2mm. Max. Bow along either vertical side is 4mm. Max twist of one corner from the other 6mm.
		Avoid kistch (objects that are in poor style of architecture) and cheap imitations (sholck art).
	v) use appropriate colour and pattern to influence perception of space.	The colour can be used to define planes, thereby making it possible to connect or separate the spaces visually.
		Warm colours such as orange or red on the floor make the room appear smaller. Cool colours such as green blue or lilac make the room appear larger.
		A grid of large sized floor tiles establishes the sense of spacious ness.
Rooms	Each room in the building must have its own personality which ties together all its functions and expresses its	The front door must present an impressive entry into reception, lobby or the drawing room whose

BASIC FUNCTION : 8 Add Aesthetics

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	purpose as soon as one enters the room.	architecture must flow into other public areas.
Interior finish	i) The design, finish and the amenities must express the individual's choice and good taste - instead of being tied down to a dogmatic type.	To secure the user's participation for choice, provide a virtual walk through the building in the planning phase, through computer simulation or a model and in the finishing stage by actual walk-through.
		Provide durable and appealing finishes of interior surfaces to bring out the character of living (lively) spaces.
	ii) People must fall in love with the interior, the moment they set their eyes on them. It must bring out the elements of impulsiveness-though the combination of products is selected after careful thought.	The interior must be a coordinated collection of fittings, furniture and furnishing. Due to their capacity to arouse sensual feelings, fabrics enhance the joy of living. They express the individual's aesthetic sense, the spirit of prosperity and comfort.
Boundary wall	Being in the field of vision, the boundary wall near the facade needs aesthetic treatment.	Use a visually pleasing pattern and finish out of a variety of finishes possible with exposed stone or brick work with deep pointing.
Fittings	We have the basic urge to touch aesthetically pleasing objects.	The form must be comfortable to touch. The tactile sense is affected by surface properties of smoothness, dryness, warmth and suppleness.
Finish	i) Most aesthetically successful colour combinations are usually personal, original muted and subdued.	Familiarity with the colour in nature has conditioned our eyes to expect earthy tones (i.e. dark colours) for the floor finishes, the colour of foliage (i.e. medium colour tone) in the middle (i.e. wall finish) and light tone for the ceiling finish. Dark colours convey weight; light colours evoke lightness.

BASIC FUNCTION : 9 Provide Service Facilities
SUB FUNCTION : Provide water

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
	ii) Colour affects the mood. Shades of yellow cheer up ; blue upsets and green calms down. Pink tones compliment the skin colour: thus they are considered friendly.	The floor may be brilliant but the rest of the room must complement so that the observers's attention is not drawn towards the feet alone. Being at the eye level, wall, door and window finishes most influence our visual perception. Try to use only two strong complementary colours for the interior of a room.
Supply and storage	Supply adequate quantity of safe (and reliable supply) drinking water daily with adequate residual pressure (12 metres for double-storied and 17 metres for three-storyed buildings) (IS 2065).	Pumps are designed for the peak demand (equal to three times the daily average). Provide water supply as per IS 1172 and IS 12183. In case of an intermittent supply from the source, provide an overhead tank to store a day's requirement. If required, an underground tank for water supply is provided for 50% of the daily requirement. In such a case, the overhead tank is required for 75% of the daily requirements.
Water supply pipes	i) Supply adequate quantity of water with requisite pressure at the outlet as per pipes IS 1172. pipe near all outlets.	Pipes must have low coefficient of friction but moderately high impact strength. Design the distribution for even pressure in the
	ii) Prevent backflow of water due to suction between a potable and a non-potable waste.	Avoid cross connection between the potable and non-potable water; water system.
	iii) Maintain good quality water supply throughout.	Prevent degradation through leakage and corrosion. Use good quality fittings and provide easy access for proper maintenance.
	iv) Eliminate water hammer damage and whistling noise due to high velocity of flow.	Avoid sharp bends. Provide gradual reduction in pipe size. Limit the maximum velocity to 2.4 m/sec. (8 ft/sec) in service pipes and 1.2m/sec (4ft/sec) in branch pipes emanating from rising main supply.

BASIC FUNCTION : 9 Provide Service Facilities
SUB FUNCTION : Provide electricity

Building Component (1)	Required Performance Specification (i.e. what to achieve) performance (2)	Design Criteria/Technical Specifications critical for (i.e. how to achieve) (3)
Internal Electrical	Provide for low resistivity and high tensile strength of conducting wires and high insulation, wiring fire and water resistance of sheathing. Limit the loss of power in the distribution system to five per cent.	Conformity with Indian Electricity Rules and of the electric supply Authority is essential.
	Insulation test, earthing test for continuity, polarity test for joining are essential. Provide appropriate street lighting as per IS2149	Provide wiring as per IS 732, 1554, 4648 5959 8601 and 9968. For power use P.V.C. insulated (heavy duty) cables as per IS 1554 (PartI). The system must take into account the ambient temperature and humidity inside the building ,presence of moisture drops, corrosive and polluting substances or excessive dust in the atmosphere or by contact fungus or mould growth; vermins electromagnetic, electrostatic or ionising influences: presence of combusti ble materials; excessive solar radiation and the condition of evacuation in case of an emergency. Workmen should posses certificate of competency and the work should be carried out under the supervision of a certified supervisor.
Telecommunification	i) Provide an efficient distribution system.	Provide a distribution system as per IS.
	ii) Provide building automation system to conserve energy and ensure safety	Signals alternate rapidly in copper wiring. Use coaxial fibre optic cables, where required, for data transmission network.

ANNEXURE - 6.2

(Sample) Criteria for Selection of Appropriate Specification

S. No.	Building Component (Alternative Products)	Relative Cost Rs./sqm of plinth	Provide work area Rs./Sqm	Control Environment			Maintain cleanliness Rs./Sqm.	Add aesthetics Rs./Sqm.	Economic Life (Years)
				Prevent Leakage (Grade) *	Provide Thermal Resistance (Grade) @	Function Cost Rs./Sqm.			
	Roofing finish								
	Lime terrace as per I.S. 3036 (I.S. 254, 712,3068)			2	3				60
	Mud phuska (I.S: 2115) and brick tiles (I.S. 2690 Pt. II)			4	3				30
	Integral Cement Plaster 1:3 with water proofing compound (I.S. 2645, 3085)			3	5				8
	Silicone based water repellents (I.S: 12027 12054) covered with			2	4				15

* Based on vapour resistance

@ Based on thermal conductivity (U - value)

ANNEXURE - 6.2 (Contd...)

S. No.	Building Component (Alternative Products)	Relative Cost Rs./sqm of plinth	Provide work area Rs./Sqm	Control Environment			Maintain cleanliness Rs./Sqm.	Add aesthetics Rs./Sqm.	Economic Life (Years)
				Prevent Leakage (Grade) *	Provide Thermal Resistance (Grade) @	Function Cost Rs./Sqm.			
	clay tiles (I.S:2690) in cement mortar 1:3								
	Extra for finish with i) Terrace tiles (I.S. 1237, 2571)			1	2				80
	ii) R.C.C. Sloped roof covered with Mangalore tile (I.S: 654)/clay tiles (I.S: 1464)/Burnt clay tiles (I.S: 2690) Half round/flat tiles (I.S: 13317)			1	4				60
	iii) Slate (I.S. 6250)			1 (Best)	2				80
	iv) Cellular concrete 5cm thick				1 (Best)				

* Based on vapour resistance
@ Based on thermal conductivity (U - value)

ANNEXURE 7.1

Table 1

Indicators of Lifestyles and Requirements of High and Middle Income Group Neighbourhoods.

High Income Group Neighbourhood

Sl. No.	Civic Amenities	Life Style	Requirement
1.	Security	Pressure from social disparity	
2.	Transport	i) By car for within city travel	i) Good Law and Order
		ii) Aeroplane for intercity travel	ii) Less disparity of adjacent neighbourhoods
			i) Good roads
			ii) Near domestic airport
3.	Education	i) High standard public schools	i) Very good English medium public schools in the locality
		ii) High standard college	ii) University or very good college near the locality
4.	i) Shopping Centre	High Standard	Net very far from City Shopping centre
	ii) Neighbourhood Shopping	Shopping everyday is not required	Neighbourhood shopping centre Intrudes on privacy
5.	Recreation	High pressure life style	i) Peaceful neighbour hood in a locality with low population density
			ii) Parks and recrea tion within a walking distance

Sl. No.	Civic Amenities	Life Style	Requirement
6.	Health	Highly health conscious	i) Healthy neighbour hood environment ii) Not in thevicinity of a hospital or a dispensary
Land			
1.	General level	Healthy locality	High ground neigh-bourhood
2.	Cost	High cost living	Very high value (nearly double of the value for M.I.G.
3.	Public water supply sewerage, drainage electricity, telecom.	High standard	Reliable and efficient service even if at a high cost/land rate
4.	Neighbours	Prestigious	Prestige of neighbours is important
5.	Permissible floor area ratio	Spacious living	Low F.A.R
6.	Size	Specious enough for lawns and outhouse, for relaxation privacy, security and servants.	Maximum size in the locality

ANNEXURE 7. 1

Table 1 (Cont.)

Indicators of Lifestyles and Requirements of High and Middle Income Group Neighbourhoods.

Middle Income Group Neighbourhood

Sl. No.	Civic Amenities	Life Style	Requirement
1.	Security	Executive tension	Secure surrounding
2.	Transport	i) Motorised two wheeler and public transport for travel within city	Nearness to place of work and bus stop.
		ii) Train for intercity travel	Near Railway Station
3.	Education	i) Good English medium public schools in the locality ii) A very good college near the locality	
4.	i). Shopping Centre	Economy	A competitive shopping centre in the locality
	ii) Neighbourhood shopping	Economy and convenience	An economical neighbour hood shopping in the vicinity
5.	Recreation	i) High value but low cost social entertainment	A neighbourhood park for elders and a tot lot for toddlers
		ii) Togetherness economical but healthy living	Medium population density and low cost entertainment

Sl. No.	Civic Amenities	Life Style	Requirement
6.	Health		i) Dispensary in the vacinity ii) Hospital near the locality but not in the neighbourhood

Land

1.	General Level	Healthy and economical	i) Economical to build and healthy to live ii) Well drained but not near a city drain
2.	Cost	High value to cost	i) Size adequate to the requirement of building ii) Reasonable land rate cost affective services
3.	Public water supply sewerage, drainage, electricity, telecom	Efficient executive	Conducive to exclusive efficiency and living together
4.	Neighbours	Efficient executive	Conducive to exclusive efficiency and living together
5.	Permissible floor	Economical living	High permissible F.A.R. to cost ratio
6.	Size	Comfortable	Optimum for maximum physical comfort as per civic bye-laws.

ANNEXURE 7.2

Table 2:

Characteristics affecting Land Rates of the Localities in City 'A'

Sl. No.	Characteristics affecting land rates	Unit	Localities AA	AB	AC
1.	Predominant Characteristics/ classification		Prestigeous & developed residential	Cosmopolita & moderately residential	Cosmopolita & developing
2.	Opportunity for business and employment in nearby localities		Establish industrial estate in adjacent locality	Established high tech. industry in the locality	Upcoming industry in the locality and nearby township
3.	Population	Nos per hectare			
	i) composition		Local & V.I.P.	Cosmopolitan N.R.I., Senior business managers,and owners	Cosmopolitan Professional
	ii) density		120	140	100
4	a) Area	Sqr.km	1	6	4
	b) Level	metre	100	60	40
5	Land use as per development plan	Percent			
	i) Residential				
	a) H.I.G. & M.I.G.		45	35	33
	b) L.I.G. & Village		NIL	15	10
	ii)				
	a) Parks and playgrounds		20	5	10
	b Agricultural and low lying drain		NIL	NIL	Adjacent
	c) Slums		NIL	5	1
	iii) Public		10	5	15
	iv) Transportation		20	25	20
	v) Commercial		5	5	2
	vi) Industrial		NIL	5	20

ANNEXURE 7.3

Table 3

Characteristics Affecting the land rates in Different Neighbourhoods in locality AB in city 'A'

Characterstics affecting the land rate	Unit	Neighbourhoods A HIG	B MIG	C HIG & MIG	D MIG
1. Civic services in the neighbourhood :-					
i) Water supply					
ii) Sewerage					
iii) Electricity					
iv) Roads		Very	Very	Very good	good
v) Drainage		good	good	"	"
vi) Telecommunication					
vii) Other services					
2. Civic amenities in the neighbourhood					
i) Security		"	"	"	"
ii) Peace and traquility					
3. Distance to appropriate class of amenities	Kilometre				
i) Place of work		6	8	8	8
ii) School		"	2	1.5 0.	5 1.0
iii) Park/Playground	metre	600	800	800	500
iv) Bus stop	"	1500	1000	500	500
v) Shopping centre					
a) upmarket	"	500	800	2500	5000
b) competitive	"	500	800	2500	5000
vi) Dispensary/health centre					
vii) Club/recreation					

Characterstics affecting the land rate	Unit	Neighbourhoods A HIG	B MIG	C HIG & MIG	D MIG
viii) Other amenities and advantages.					
4. Environment (distance to the nearest feature)					
i) Slum	Metre	2000	500	1000	500
ii) Village/low income group or economically weaker section neighbourhood	"	1500	500	500	500
iii) City drain	"	NIL	NIL	1200	500
iv) Low lying/marshy land					
v) Other disadvantages.					

ANNEXURE 7.4

Table 4:

Indicators of Rapid increase in Land rates in Immediate future in City 'A'

Locality	Time of Occurance	Leading indicator/factor for rapid increase in land rate in the immediate future.
AA	Rapid growth of income , business and economy	1. V.I.P. locality No low group neighbourhood. in the city
		2. Best civic amenities suitable for V.I.P/super rich 3. Twenty percent of the area is reserved for parks and open space. 4. Low population density in spite of being located in the heart of the city.
AB	First quarter of year 1994	Demand for accomodation from NRIs and multinational firms due to relaxation of FERA and businessmen from other cities due to the shift of business from Bombay, cosmopolitan nature of the locality and nearness to the airport.
	Last quarter of year 1994	1. Increased demand from NRIs, businessman from other ities and multinationals.
		2. Purchase of land by developers, investors and speculators
		3. prospect of change in land use of a large area from "Industrial"to "Residential"

Locality	Time of Occurance	Leading indicator/factor for rapid increase in land rate in the immediate future.
		in the future revised compre hensive development plan
AC	Third quarter of year 1994	1. Buyers who could not afford the very high land rate in locality AB peferred locality AC due to its cosmopoli tan nature.
	lands in locality AB, moved	2. People who sold their to this and other less costly localities.

ANNEXURE 8.1

Additional Information for Valuation of Flat Residential / Commercial/ Office/ Godown :

1. Use :
2. Postal address of flat :
3. Prospective buyer group : V.I.P./H.I.G/M.I.G/L.I.G
4. A) Location of flat
   i) Floor No. ii) Location :
   B) Orientation :
   i) Direction :
   ii) Satisfaction Very good/satisfactory/unsatisfactory
5. Consideration
   A) For Flat
   i) As per Agreement : Rs. ii) Discounted value : Rs.
   B) For covered/uncovered parking space
   i) As per Agreement : Rs. ii) Discounted value : Rs.
6. Description of property
   A) LAND
   a) Total area :
   b) Proportionate undivided area (for flat) :
   c) Zone :
   d) CDP Sheet No. :
   e) F.A.R. i) Permissible : ii) Achieved :

B) BUILDING

a) Year of construction :

b) Type of construction :

c) Specifications for common areas & amenities :

i) Cladding on walls :

ii) Floor :

iii) Lifts :

iv) Stand-by Generators :

v) Common services eg. Fire fighting, Electric Substation/Transformer/ Dish Antenna/Telephone etc.

vi) External amenities for rest & recreation (such as swimming pool, club house etc) and shopping parking for visitors etc.

C) FLAT

i) New/used & depreciated :

ii) Area of flat

iii) Super built-up area of flat

iv) Area of covered/uncovered parking space :

v) Servant's accommodation :
Special advantages :

Special disadvantages :
Flat Rate :

ANNEXURE 8.2

Calculation of Plinth Area Rate of flats and cost index (for reinforced concrete framed construction) at .... for High Income Group as on........ with plinth area rates of construction in the same city on .... as base 100

Sl. No.	Description	Unit	Qty.	Base rate	Weigh-tage	Rate at site	Cost index
1.	Cement	Quintal	2.00				
2.	Steel reinforcement	Quintal	0.40				
3.	Sand i) Coarse	Cu.m.	0.35				
	ii) Fine	Cu.m.	0.20				
4.	Aggregate, 20 mm.	Cu.m.	0.40				
5.	Bricks	1000	0.30				
6.	Centering & shuttering	Sq.m.	3.00				
7.	Doors, Windows and Cupboards						
7.1.	Teak wood for door frame	Cu.m.	0.01				
7.2.	Flush door shutter 30 mm thick with teakply	Sq.m.	0.15				
7.3.	Aluminium window	Sq.m.	0.15				
7.4.	Mild steel grill (decorative)	Kg.	3.00				
7.5.	Cupboard with shutter with Teak ply	Sq.m.	0.09				
8.	Marble for floor	Sq.m.	1.00				

Sl. No.	Description	Unit	Qty.	Base rate	Weigh-tage	Rate at site	Cost index
9.	Paints & Distempers						
9.1.	Polish	Litre	0.13				
9.2.	Plastic emulsion paint	Litre	0.50				
9.3.	Cement paint	Kg.	0.90				
10.	Miscellaneous materials						
11.	Labour						
11.1	Skilled	Each	5	per sqm. plinth			
11.2	Unskilled	Each	5	per sqm. plinth			

Total Weightage = 100.00

ANNEXURE 8.3

Calculation of Plinth Area Rate of Flats and cost index for flats (with reinforced concrete farmed construction) at .... for Middle Income Group as on........ with plinth area rates of construction in the same city on .... as base 100

Sl. No.	Description	Unit	Qty.	Base rate	Weigh-tage	Rate at site	Cost index
1.	Cement	Quintal	2.00				
2.	Steel reinforcement	Quintal	0.40				
3.	Sand 1) Coarse	Cu.m.	0.35				
	2) Fine	Cu.m.	0.20				
4.	Aggregate 20 mm.	Cu.m.	0.40				
5.	Bricks	1000	0.30				
6.	Centering & shuttering	Sq.m.	3.00				
7.	Doors, Windows and Cupboards						
7.1.	Pressed steel door frame	Metre	0.50				
7.2.	Flush door shutter 30 mm thick with comm. ply	Sq.m.	0.15				
7.3.	Hardwood for window	Cu.m.	0.004				
7.4.	Mild steel grill (decorative)	Kg.	2.50				
8.	Floor tiles	Sq.m.	1.00				
9.	Paints & Distempers						
9.1.	Paint	Litre	0.13				
9.2.	Distemper	Kg	0.40				
9.3.	Cement paint	Kg.	0.90				
10.	Miscellaneous materials						
11.	Labour						
11.1	Skilled	Each	5	per sqm. plinth			
11.2	Unskilled	Each	5	per sqm. plinth			

Total Weightage = 100.00

ANNEXURE 8.4

External Services for Flats

Services	Relative cost (Rs.)	Per unit
Lift	1.50 lakhs	Passenger
Telephone wiring and T.V. Antenna	1% of	Building Cost
Manually operated electric alarm system		Set
Fire fighting system (wet riser)		Set
Indoor sports building		Sq.m.
Swimming pool with equipments		Sq.m.
Emergency lighting and electricity		Set
Devlopment of Site		
Levelling and dressing	25	Sqare metre of land
Roads and paths	10	"
Strom water drains	7	"
Tubewell and pump	50	"
Underground sump	7	"
Rising main and overhead tank		
a. Tank on terrace	10	Litre
b. Tank with independent staging	15	"
Peripheral pipe grid 150 mm.dia.	25	Square metre of land
Water supply distribution lines	40	"
Under ground sewerage upto 300mm. dia.	50	"
Sewage treatment	470	Person
Landscaping including unfittered water supply	60	Sqare metre of land
Street lighting		
a. with flourescent lamps	30	"
b. with high pressure sodicum vapour lamps	50	"

ANNEXURE 10.1

Outline Of A Pre-Feasibility Study

1. Summary- A synopsis of all the essential findings.
2. Project background :
   Details about the sponsors, their past experience, history of the proposal for development based on identification of investment opportunities, investigations and studies done.
3. Prospective locations :

For each prospective locality

A. Market (Details required in addition to those indicated in the outline for market study) :

(a) Demand

(i) The size of the existing market demand, past growth, indicators of growth, estimated future growth (including price vs volume for each class), major problems and prospects.

(ii) The role of the real estate development in the context of the local priorities and the city development plan.

(b) Supply

(i) Capacities of the existing development schemes and market leaders.

(ii) Major programmes of development.

(c) Forecast of sales and marketing

(i) Anticipated competition from existing and potential developers from the city and outside.

(ii) Marketing and Sales programme;

B. Site particulars (as in Annexure 2.1 and Annexure 10.3)

4. Organization and overhead costs (overall)

(a) Organisation for

(i) production

(ii) sales

(iii) administration

(iv) management

(b) Estimated overhead cost

(i) Site overheads.

(ii) Administrative expenses

(iii) Financial overheads

5. Development of project alternatives:

For each project

(A) Rough scope of the project indicating approximate total developed land area for sale, permissible floor space index or plinth area and super built area of flats which can be constructed for sale, number of floors and basement and the list of service and outdoor amenities to be provided.

(B) Technology

(i) Technologies and processes that can be adopted based on technical feasibility (these are detailed as shown in annexure 10.4 and are based on the criteria specified in chapter 11)

(ii) Rough layout of proposed development (major components) showing the main building, ancillary buildings and the external services

(C) Material inputs, their present and potential sources of supply

a. Locally available materials

b Manufactured materials

c. Prefabricated facilities

d. Equipment

(D) Manpower

(i) Estimated manpower requirement : Staff and Labour (local and outside) according to the categories of skills

(ii) Availability of manpower : Source

(E) Rough cost estimate (indicating the basis) on :

a. site development

b. building

c. Services

(F) Financial evaluation (with approximate quantities)

(a) Total investment cost

(i) Estimate of working capital requirements

(ii) Estimate of total investment cost including the cost of pre-investment and feasibility studies

(b) Project financing

(i) Proposed capital (shares)and financing

(ii) Source

(iii) Interest

(c) Estimated sales (stagewise)

ANNEXURE 10.2

Outline of a market study (For each prospective locality)

1. The basic features of the locality: The area, size , leading physical features and civic amenities with maps showing the main characteristics.
2. Population and ethnic group, occupation pattern and economic group, per capita level of income and socio-economic background of the population (all set in the context of the country's socio-economic structure and highlighting distinguishing features).
3. Leading economic activities of the locality. Is the neighbourhood changing ? Is the rent competitive or high in the locality? To what extent will the location affect sales? It is competitive?
4. Basic exploited and potentially exploitable economic factors.
5. Structure of any existing market for real estate.
6. Infrastructural facilities and civic amenities especially of transport and power, conducive to development of real estate.
7. What do competitors offer? What market niche is available considering the comparative benefits according to a comprehensive check list of real estate development projects being undertaken and those that can be developed on the basis of the available resources and infrastuctural facilities. Advantages and disadvantages of a few prospective sites.
8. A check -list revising the one mentioned in item 7 by a process of elimination and excluding the following:
   (a) Those for which present local demand is too small;
   (b) Those which face too severe a competition from adjoining areas;
   (c) Those which can be more favourably located in other areas;
   (d) Those which require infrastructure not existent in the area;
   (e) Those requiring substantial investment for development of land (if the area is located in the interior);
   (f) Those which do not fit into the development plan priorities and allocations for the city ;

9. What are the target markets? What characteristics do the highest prospective buyers share? (Is it achievement or business oriented, aristocrat and financial strength ?) What type of development do people buy and why?

10. Are sites in the most prospective locality available? If not, why?

11. Estimation of present demand and identification of opportunity for development, based on real estate transactions.

12. Potential problems.

13. How will the specifications and appearance of the existing buildings affect the sales? Estimated capital costs (lumpsums)of projects at a few selected locations taking the following into account:

    (a) land;

    (b) Buildings and services

    (c) Equipment

ANNEXURE-10.3

Information required (for each site) for final selection of site,its development and land value by development method .

(These details are in addition to those indicated in Annexure 2.1 Annexure 4.1 Annuexure 4.2)

Details of prospective locations in each of the prospective localities short-listed on the basis of market study. (Locations are marked on the Survey of India Map for the city.)

A. Location

1. Location and address of the site
2. Preliminary soil investigation
3. How will the site affect the sale of developed property? Is it good from a competitive real estate development point of view? Is it well connected for effective transportation of people and goods?
4. Is the rent in the neighbourhood high or competitive for the area? If the site is low-rent , how will it attract prospective customers?
5. Will neighbourhood developments (including real estate developments) help to draw customers? Is the immediate neighbourhood changing? If so, will it affect the sales?
6. Is adequate street-side parking space available?
7. Proximity to parks, play grounds, railway station, airports and bus depot.
8. Time and cost of daily travel to place of work.
9. Can the location be used to best advantage? If so, how ?
10. What are the disadvantages of the site? Can these be overcome ?
11. Is the best site available for development business? If not, why?

B. Neighbourhood

1. Climate: Wind direction, air temperature, humidity, direction of sunshine,
2. Approach road and the general arrangement for drainage
3. Topography
4. Land use
5. Medical facilities and places of worship
6. Result of trial bores, if any, in the immediate neighbourhood
7. Classification of the properties along the streets
8. Cleanliness

C. Present stage of development in the neighbourhood

i) Filtered water supply (per capita)

ii) Roads

iii) Sewerage

iv) Drainage

ANNEXURE 10.4

Outline of the Scheme for Development

A. Scheme

1. Site preparation

i) Soil investigation

ii) Boundary wall and security arrangement

iii) Demolition of existing structures including foundations.

iv) Shifting of roads, pipelines, cables, streams etc.,

v) Levelling of site

vi) Approach roads and internal paths

vii) service connections for water, electric power and telecommunication

ix) Layout of external services such as water supply sewerage, electric supply, street lighting and telecommunication.

x) Temporary work such as huts for labourers, site office, storage etc.,

xi) If the land is low lying, details of special filling and soil stablilisation.

2. Buildings

i) Main buildings

ii) Ancillary buildings and other civil works such as pump house, electric substation and generator house, car and two wheeler parking, under ground and overhead tanks. fire fighting, air-conditioning, water treatment, sewage treatment, and solid waste disposal.

iii) Recreational amenities such as landscaping, indoor sports building, club house, community hall, swimming pool, garden and children' park (with swings, slides, gazebo etc.,)

3. Water supply (If a separate source exists or is proposed for gardening and waste disposal, the details are given separately for filtered water supply and infiltrated water supply)

i) Source

ii) Result of tests

iii) If supply is proposed from existing unfiltered/filtered water mains.

4. Sewerage and Sewage Disposal

   i) Proposed arrangement for Disposal of sewage, if no public sewer age system exists

   ii) If public sewerage system is available, can permission of local body be obtained to discharge the sewage into existing sewer directly?

5. Special equipment

B. Selection of technology (for each building and each service according to the criteria explained in chapter 11).

List of available in -situ processes and prefabricated or manufactured whole components for each of the building components not available locally. Why a particular technology is selected is supported by the following details.

i. list of prefabricated parts or components available and the economy in cost and time vis-a-vis cast -in -situ construction.

ii. List of machinery and equipment available for services and their costs and saving in time vis-a-vis in situ assembly or manufacture. The source of technology may be indicated, if not available locally.

iii. Availability of skilled manpower, its source, wage levels and availability of accommodation to house them.

iv. Availability of good quality materials, their sources and price levels for preparation of cost indices.

ANNEXURE 10.5

Economic Feasibility Analysis

(for each project alternative)

Project Item	Alternative Number Basic information	Financial year 1	2	3
1.	Investment Initial investment (cost of land)			
2.	Cost of development 2.1. Cash expenses (excluding interest) 2.2. Depreciation 2.3. Replacement 2.4. Interest Total =			
3.	Income 3.1. From sales of real estate 3.2 From sales of other assets 3.3. From other sources Total =			
4.	Taxes			

Financial analysis

5.	Net cash earnings 5.1. Gross profit (3 - 2 - 1) 5.2. Net profit after taxes 5.3. Net profit plus depreciation Net cash flows (5.3. - 1)			
6	Sources of finance 6.1. Equity (shares) 6.2. Loans 6.3. Others			
7.	Financial obligations 7.1. Repayment (instalments) 7.2. Interest 7.3. Dividends			
8.	Net cash balance (5 + 6 - 7)			
9.	Cumulative net cash balance			

ANNEXURE 10.6

Determination of land rate by Development Method

Assumption:

1. Duration of planning form the date of agreement to purchase land to the date of start = 9 months

2. Sale of flats starts 3 months after the date of start

3. Period of completion = 15 months.

Data :

a. Area of land =

b. Floor Area Ratio permissible =

c. Plot coverage permissible =

d. Plinth Area Rate for building construction =

d1. Plinth area rate for garage =

e. Market rate for sale of super-built area =

f. Market rate for sale of garage =

Ratio of super-built area to permissible floor area (R1) (excluding basement)=

Ratio of super-built area to permissible floor area (R2) =

Ratio of area of garage to area of basement (R3) =

g. Building (supper built) area = (a*b*R1)+a*c(1-R3) =

h. Building garage area = a*c*R3 =

Sale value of the project :

a. Market value of flats g*e =

b. Market value of garages h*f =

c. Discounted value of sale value deferred for 1.5 years =

Construction cost :

d. Development of site including external services and connections =

e. Development cost of neighbourhood amenities =

f. Flats = g*d/ R1=

g. Add for all services in the bldg (details are enclosed) =

h. Add for garage = (h*d1)

j. Add for services of garage @ 5% of h =

k. Total = d+e+f+g+h+j

m. Add for feasibilty survey, architect's fee and supervision charge @ 2% on, k,

n. Add for establishment, contingency, tools and plants and overheads @ 6% on ,k =

q. Total cost of construction = k+m+n+p

Discounted value of cost of construction deferred for 16.5 months =

r. Interest @ 18% p.a on working capital (i.e 18% of 20% on k) =

s. Add for promoter's profit @ 10% =

t. Total cost of construction =

u. Land value = (sale value - construction cost)=(c-t)=

v. Land rate) = u/a=

ANNEXURE 10.7

Market Value of a Partly Tenanted Property for Further Development by Construction of Flats (without relocating the tenant).

1.1 Gross monthly rent.

1.2 Gross yearly rent

1.3 Outgoings (see Annexure 3.3)

1.4 Net yearly income = (1.2)-(1.3)

1.5 Estimated future life.

1.6 Rate of capitalisation

1.7 Rate for redemption of capital

1.8 Year's purchase (from standard Tables)

1.9 Capitalised value of rented portion of premises

1.10 Area of land.(A)

1.11 Permissible floor area ratio(F.A.R)

1.12 Ratio of super-built to permissible floor area (k)

1.13 Total super-built area by development = (A*F.A.R.*k)

1.14 Actual plinth area occupied by tentant (a)

1.15 Net saleable super-built area = (1.13)-(1.14)

1.16 Net saleable super-built area ratio= (1.15)/(1.10) =

1.17 Market Rate for land with comparable permissible super-built area ratio =

1.18 Value of land corresponding to the saleable super-built area = (1.17) * (1.15)

1.19. Fair market value of entire property = (1.9) + (1.18)

APPENDICES

APPENDIX 1

LIST OF ACTS

A. Indian Acts Relating to Property, Its Acquisition and Transfer.

1. Indian Contract Act, 1872
2. Transfer of property Act, 1882
3. Limitation Act, 1963
4. Specific Relief Act, 1963
5. Land Acquisition Act, 1894
6. Indian Requisition Act, 1908
7. Code of Civil Procedure, 1908
8. Indian Easements Act, 1982
9. Partition Act, 1893
10. Indian Evidence Act, 1872
11. Indian Stamp Act, 1899
12. Public Premises (Eviction of Unauthorised Occupants) Act, 1971,
13. Sale of goods Act, 1930
14. Hindu Succession Act, 1956
15. Muslim Personal Law (Shariat) Application Act, 1937
16. Married Women's Property Act, 1874
17. Societies Registration Act, 1860
18. Indian Partnership Act, 1932
19. Cooperative Societies Act, 1912
20. Indian Trusts Act, 1882
21. Hindu Disposition of Property Act, 1916
22. Government Grants Act, 1895

(Particular) State Act

1. State Acts and Rules corresponding to the Indian Acts.
2. (State) Rent Control (or) Tenancy Act
3. Town and Country Planning Act.
4. (State) Land Revenue Act.

5. (State) Vacant Lands (Prohibition of unauthorised occupation and summary eviction) Act.
6. (State) Housing and Area Development Act.
7. (State) Zila Parishads and Panchayat Samities Act

Acts relating to development of an urban property

1. (city) Metropolitan Development Act.
2. Municipality/Municipal Corporation Act.
3. Arbitration Act.
4. Indian Electricity Act.
5. Payment of Wages Act.
6. Minimum Wages Act.
7. Workmen's Compensation Act.
8. Hotel and Lodging House Rate (control) Act.
9. Water Pollution Control Act.
10. Environmental Protection Act.
11. Coastal Area Protection Act.

Acts relating to taxes on urban properties

1. Income Tax Act.
2. Wealth Tax Act.
3. Gift Tax Act.
4. Municipality/Corporation Act.

APPENDIX 2

AGREEMENT FOR SALE OF A FLAT UNDER CONSTRUCTION

THIS AGREEMENT MADE AT

ON THIS DAY OF 199 between

M/S. --, a partnership firm having its registered office at -- represented herein by its managing partner ---------------------------- herein after refereed to as the land holder and developer which term shall, where the context so admits be deemed to include their partners, successors in office and assignee of the first part:

AND

______________________________ PRESENTLY RESIDING AT ____________________ here in after called the "prospective purchaser" (which term shall, where the context so admits be deemed to include his/her/their/ heirs, executors, administrators, legal representatives. and assignee) of the second part;

Whereas M/s_________________________ having its registered office at ____________________ hereinafter called the owners, own the immovable property having Khata No ______ more particularly described in the schedule 'A' hereunder written, which for the sake of brevity shall hereinafter be referred to as schedule 'A' PROPERTY absolutely and free from encumbrance.

AND WHEREAS

a) By and under agreement in writing, dated ________ made between the Original Owners on the one hand and M/s ____________________________ the Land Holder herein on the other hand , the original owners agreed with LAND HOLDER to sell and convey the aforesaid property, admeasuring ...... sq mtrs. free from encumbrances, charges and/or claims for the consideration and on the terms and conditions contained in the said Agreement for Sale, dated _____. The said portion agreed to be sold to the LAND HOLDER is more fully described in the Schedule A hereunder.

b) The Original Owners handed over to the LAND HOLDER vacant possession of the said schedule A property and consequently the LAND HOLDER IS FREE TO DEAL AND DEVELOP THE Schedule A property.

c) The entire consideration as agreed by and between the original owner and the LAND HOLDER has been paid by the LAND HOLDER to the original owners, last of the payment being made on ___________

d) The LAND HOLDER AS DEVELOPERS have commenced the development work on such land (ie., the schedule A property) in the building named..................................

AND WHEREAS the First party are the builders and have formulated a Scheme for the construction of a multistoryed building comprising .... and other ancillary buildings on schedule 'A' Property and got the plan sanctioned vide.................................. issued by .... (Layout Plan at Annexure-1).

The scheme of development envisaged construction of the residential apartments/office space in the said building for different persons in whose favour ultimately a deed of conveyance would be obtained by the LAND HOLDER directly from the original owner (or if the LAND HOLDER has obtained title to the land in its own favour from the Original Owners and in such an event the LAND HOLDER would itself execute a Deed of Conveyance) of an undivided fractional interest of the said land and as described in the schedule B in proportion to the saleable super-built up area of the Apartment/s to the total saleable super built up area of the block) and conditions of the proposed transaction being that as and by way of a package deal(not capable of being segregated or separated or terminated , one without the corresponding effect on the other), the LAND HOLDER would agree to sell an undivided fractional interest in the said land described in the Schedule B hereunder written on condition that the DEVELOPERS (on behalf and as developers for such person) would construct a flat/s for and as a residential unit/s ultimately to belong to such person, the residential flat/s

AND WHEREAS the second party herein has entered into an agreement this day with the Land holders for the purchase of undivided share, right, title and interest in schedule 'A' property which share is more particularly mentioned and described in the schedule 'B' hereunder written which shall herein after be referred to as SCHEDULE 'B'

PROPERTY

AND WHEREAS under the said agreement, the second party has agreed to own the Schedule 'B' property in common along with the purchaser/s owners of other undivided shares of Schedule 'A' property

AND WHEREAS the Second Party requested the First Party to build one Residential apartment /office space in the said multistoreyed building proposed to be constructed on schedule 'A' property. WHEREAS the first party have agreed to construct flats/office/spaces/residential Apartment bearing No.______________ in floor in __________ Block along with fixtures, fittings and amenities and with /without parking space no.___________ in Basement on behalf of the Second Party more particularly mentioned and described in schedule 'C' hereunder written which for the sake of brevity shall herein after be referred to as SCHEDULE 'C' PROPERTY in accordance with the sanctioned plan and the specifications contained hereunder. (Location of the flat is marked on the drawing at Annexure-3)

AND WHEREAS the first party will also construct other buildings and apartments with or without Car Parking spaces for owners and other intending purchasers of the schedule 'A' property and as such it is agreed that first party and the second party shall abide by the terms and conditions mentioned in the schedule 'D' 'E' 'F' AND 'G' happened and forming a part and parcel of this agreement

NOW IN CONSIDERATION OF THE PREMISES HEREINBEFORE RECITED and further consideration of the advantages and obligations accruing and undertaken by the parties hereto respectively, this agreement witnesseth as follows:

1. The LAND HOLDER has shown to the Prospective Purchaser the original of the certificate of title dated .... issued by the Advocate for LAND HOLDER certifying the title of the said company to the said land and a copy of the said certificates is annexed hereto as Annexure 2. The Prospective Purchaser confirms that he/she/it is satisfied about 'the marketability' of title of the said land and will not require any further proof thereof nor decline to pay or delay payment of any amount in this connection.

   ii) The land holder has shown to the prospective purchaser the original plans and specifications of the building to be built as approved by the local authority.

2. As and by way of a package deal:

M/s ______________________________ (AS LAND HOLDER) agrees to sell to the Prospective Purchaser an undivided share right, title, and interest in the said land described in the Schedule 'B' hereunder written (with no right to the prospective purchaser to claim any separate sub-division and the right to exclusive possession of any portion of the said land) for a Lumpsum agreed and quantified consideration of Rs. __________ to be paid by the prospective purchaser to the LAND HOLDER at the time in the manner stated in clause .... hereof:

b) M/s______________________ as Developers for the Prospective Purchaser, shall construct for and on his behalf a residential/office flat to belong to the Prospective Purchaser, the said unit details whereof are set out in the Schedule 'C' hereunder written and the flat is marked on the plan annexed hereto as Annexures 3 and as per the specifications set out in Annexure 4) for a lumpsum agreed and quantified consideration of Rs. .... (which is inclusive of Rs.......... towards right of exclusive use of Car parking space) to be paid by the Prospective Purchaser to the Developers at the time and in the manner set out in clause 3 hereof,

3. Out of the aforesaid consideration of Rs........... payable by the prospective purchaser to the Land Holder (referred to in clues 2(a) above):

   a) The prospective purchaser has paid to the LAND HOLDER the sum of Rs. ________ on account and towards the said consideration money, the payment and receipt whereof the LAND HOLDER hereby admits and acknowledges.

   b) The balance amount viz., Rs. _____________

(Rs.____________________ only) shall be paid by the prospective purchaser to the LAND HOLDER by the undermentioned instalment viz.

1) Rs.________________________on_______________199

2) Rs.________________________on_______________199

3) Rs.________________________on_______________199

4) Rs.________________________on_______________199

5 Rs.________________________on_______________199

6) Rs.______________________on______________199

7) Rs.______________________on______________199

8) Rs.______________________on______________199

9) Rs.______________________on______________199

10) Rs.______________________on______________199

VIZ., THE ULTIMATE BALANCE in the time and in the manner set out in clause 4 hereof.

4. Out of the aforesaid consideration Rs. ___________

(Rupees ________________) payable by the prospective purchaser to the Developers (referred to in Clause 2(b) above) ;

a) The Prospective Purchaser has paid to the Developers a sum of Rs. _______ (Rupees ______________) on account and towards the said consideration money, the payment and receipt whereof the Developers do hereby admit and acknowledge:

b) The balance amount viz., Rs ______________

(Rs.________________ only) shall be paid by the prospective Purchaser to the DEVELOPER by the undermentioned instalments viz.,

1) Rs.______________________on______________199

2) Rs.______________________on______________199

3) Rs.______________________on______________199

4) Rs.______________________on______________199

5 Rs.______________________on______________199

6) Rs.______________________on______________199

7) Rs.______________________on______________199

8) Rs.______________________on______________199

9) Rs.______________________on______________199

10) Rs.______________________on______________199

viz., the ultimate balance against delivery of possession of the said unit by the DEVELOPERS to the Prospective Purchaser;

5. The Land Holder agrees that after the aforesaid Building is fully constructed (or, earliei if the LAND HOLDER so decides) and after the full consideration money receivable has been paid, the

LAND HOLDER WILL obtain a Deed of Conveyance from the Original Owners (or the LAND HOLDER ITSELF WILL CONVEY, AS THE CASE MAY BE) in favour of the Prospective Purchaser, of an undivided________ share right, title and interest in the land described in the Schedule 'B' hereunder written. The balance consideration money in respect of the said land payable by the prospective purchaser to the LAND HOLDER under clause 3(b) above shall be paid simultaneously with either :

i) The Land Holder obtaining/executing Deed of Conveyance in favour of the prospective purchaser;

OR

ii) if the LAND HOLDER so decides simultaneously with the Prospective Purchaser being put in vacant possession of the said unit constructed by the DEVELOPER.

6. The undermentioned terms and provisions are express conditions to be observed, performed and fulfilled by the Prospective Purchaser, on the basis of which this Agreement has been entered into by the LAND HOLDER AND THE DEVELOPERS and the due and proper fulfilment whereof are to be conditions precedent to any title being created and/or being capable of being claimed by the prospective purchaser in the aforesaid fractional interest in the land described in the Schedule 'B' hereunder written and/or the said premises:

7. The second party shall pay the aforesaid Instalments voluntarily on the respective due dates, default in payment of the instalment will make this agreement null and void at the option of the first party and/or terminated or put an end to after giving 15 days notice and all amounts received by the First Party shall stand forfeited. However the First Party shall have an option to condone the delay, provided, the second party pays 20% interest per annum on the outstanding amount till payment, which shall not be extended for a period of more than 30 days.

8. This is a composite arrangement and is by way of a package deal and the Prospective Purchaser shall not be entitled to claim or demand any severence or separate performance by the other parties or either of them, of any individual term or provision of this agreement without being bound and liable at the same time to agree to perform the rest of the terms and conditions of this Agreement:

9. The prospective purchaser shall not to be entitled to terminate this Agreement or to **receive** from his/her/its obligation to make payment and/or perform his/her/its obligation in respect of the aforesaid fractional interest in the land without being bound and liable to pay the balance consideration money and/or to perform his/her/its obligations in respect of the said premises and vice versa;

10. The overall control and management of the said project and the construction and completion of the said building shall be with the DEVELOPERS and furthermore the DEVELOPERS are and shall continue to be in possession of the said land and building and shall be entitled to a lien thereon until the project is completed and the last of the apartments has been handed over to its purchaser. The Prospective Purchaser shall not be entitled to claim or demand from the LAND HOLDER, POSSESSION OF ANY PORTION OF THE SAID LAND. The First Party shall under normal conditions complete the construction of the building and hand over possession of the Schedule 'C' property on or before ____________ subject to force **mature**, availability of essential items for the construction and also subject to unforeseen events such as acts of God, earthquake, floods , war and /or other local disturbances, changes in the laws of the state beyond the control of the First Party and also the receipt of completion/no objection/occupancy certificate from the concerned departments.

11. The First Party shall permit the Second Party to have access at all reasonable times to the works while under constructions and to inspect the same.

12. The First Party will be entitled if necessary or advisable to deviate in a minor way from the said plan and specification without obtaining the permission in writing of the Second Party, provided in so doing the interest of the Second Party shall not be adversely affected, and the First party shall not violate the sanctioned plan.

13. It is hereby agreed by the Second Party that from the date of Schedule 'C' property is ready for occupation for which a notice has been received by him from the First Party whether possession of the same is taken by him or not he/she/ they shall pay regularly in advance for a minimum of 12 months the proportionate share of expenses that may be decided by the First Party in all the outgoings on general expenses in respect of the property such as

insurance of building, security, landscaping, water supply, maintenance of the lifts, pump station, generator, street and general maintenance. The Second Party shall keep deposited with the First Party a sum of Rs............ (Rupees ....only) which will remain with the First Party until the Owners' Welfare Association is constituted and aforesaid deposits or unspent portion thereof shall be paid over to the duly constituted body as aforesaid.

14. It is hereby agreed that the Second Party shall/shall not get covered parking space constructed for additional cost for right to exclusive use of the parking space in the basement failing which the Second Party , and the tenant, licencee or those who occupy the apartment/ office space through him/her/them or in trust for him/her/them shall have no right to park the four wheeler automobile in any part of the building.

15. The First Party shall not be responsible for any defect in the building noticed after a period of twelve months from the date of handing over possession.

16. It is hereby agreed between the parties that the First Party shall have absolute power to construct other buildings on Schedule 'A' property with or without car parking space on behalf of the owners and other purchaser/s of the Schedule 'A' Property or otherwise on such terms and conditions at their absolute discretion subject to the approval of the plans by plan approving authority.

17. The First Party shall have the first charge and lien on the Schedule 'C' property until the entire consideration is paid by the Second Party and compliance of all the terms and conditions under this agreement.

18. The First Party further agrees to execute additional items of work (other than specified in Schedule 'C') as required by the Second Party on a separate and mutually agreed terms and/ or rates, or that the second party shall be at the liberty to get additional items of work done by his/her/their own agency after possession is handed over to him/her/them by the First Party.

19. As soon as the minimum number of persons required to form Co-operative society or a company have taken flats, the developers shall within the prescribed period submit an application to the Registrar for registration of the organisation of persons who take the flats as a co-operative society, or as the case may be, as a

company; and the promoter shall join, in respect of the flats which have not been taken possession in such application for membership of a co-operative society, or as the case may be, of a company.

Nothing aforesaid affect the right of the promoter to dispose of the remaining flats.

The Second Party hereby covenants and assures the First Party that the Second Party shall become member of the Owners' Association to be formed and registered and shall observe and perform the terms and condition, bye-laws, rules and regulations of the association. The said association will maintain the common areas, services and amenities as described in Schedule 'D', pay for the common expenses, pay separate assessment/taxes of the building, look after the welfare, maintenance and repairs etc., and the Second Party shall pay the charges proportionately as described in Schedule 'E'

20. The Second Party herein shall sign and execute declaration, bye-laws, affidavits, undertakings, papers and documents required and also for the Electricity Board, Water Supply and such other authorities.

21. The developer shall take all necessary steps to complete his title and convey to the organisation of persons, who take flats, which is registered either as a co-operative society or as a company as aforesaid, or to an association of flat-takers his right, title and interest in the land and building and execute all relevant documents and if no period for the execution of the conveyance is agreed upon, he shall execute the coveyance within the prescribed period and also deliver all documents of title relating to the property which may be in his possession or power.

22. The prospective purchaser shall pay at the proper time and place the price, the municipal taxes, water and electricity charges, ground rent (if any) , and other public charges payable in respect of the flat taken by him and where a co-operative society or a company of persons taking the flats is to be constituted co-operate in the formation of such society or company , as the case may be.

The Second Party doth hereby agree to pay such transfer charges, stamp duty, Registration Charges etc., in the event it being necessary on account of any promulgation of any act, ordinance, circular, rules and change in laws or for any other reason.

23. In respect of any dispute arising between the parties relating to this agreement in any matter what so ever the same shall be settled in accordance with the provisions of the Indian Arbitration Act, and the statutory modification there of and the juridication shall be ....

24. It is hereby agreed that the Second Party shall not cause any hindrance to the First Party during the course of construction nor shall do such things that may delay or stop the project of the First Party.

SCHEDULE 'A' HEREINBEFORE REFERRED TO

(Schedule of and land building held by the land holder from the owner).

SCHEDULE 'B' HEREINBEFORE REFERRED TO

________________ Undivided share, right, title and interest in the property being Khata No. .... more fully described in Schedule "A" above. The undivided share of the site are of the Schedule "B" property works out to _________equivalent to___________ sq.fit/ sq.mt.

SCHEDULE 'C' HEREINBEFORE REFERRED TO

Office Space/Flat/Residential apartment measuring_________ sq.ft./ sq.mt. of super-built up area ON. ________ floor ________ block with/without parking space NO.______________ with exclusive right for use of car parking space in basement of the multistoried building known as ______________ proposed to be constructed in the property described in Schedule 'A' together with proportionate share in other areas of common use with following specification : (It is clarified that super-built up area referred herein and elsewhere and includes and comprises the following;-

i) The plinth area of the flat/apartment

ii) The balcony/balconies and other accessible projections of the flat/ apartment.

iii) The plinth area worked out on the basis of the proportionate share in the outer walls and common built up areas.

SCHEDULE 'D'

a) List of common areas and facilities

b) List of limited common areas and facilities reserved for use of apartments..........

c) Terms and condition for use of common areas.

SCHEDULE 'E'

The Second Party in proportion to his/her/their undivided share with other purchasers shall be deemed to have accepted to the following conditions and to have contracted to bear the following expenses in proportion to his/her/their undivided share, from the date of handing over possession of the flat to him/her/them.

1. All the rates, outgoing if any in respect of the land described in the Schedule 'A' hereto and the building thereon.

2. Payment of electrical, water and other charges for common services.

3. The expenses of routine maintenance including painting, white colour washing, cleaning etc., and maintenance of the common areas, utilities and services as set out below:

i) Maintenance of pumpset and other machineries, sanitary and electrical lines common to the building.

ii) Replacement of bulbs etc., in common areas.

iii) Maintenance of horticulture operations in common areas.

iv) Maintenance of swimming pool and other recreational utilities.

v) Provision of watchman, pump operator and other security staff etc.,

Should the second party default in payment due for any common expenses, the builders or the association of the apartment owners shall have the right to decide and remove such common benefits or amenities including electricity and water connection from his/her/their/enjoyment.

SCHEDULE 'F'

Restriction on the right of the second party

SCHEDULE 'G'

1. The first party will require every person who shall hereinafter construct any construction comprised in the said apartment complex to covenant and to observe restriction set forth in the schedules above.

2. That the First Party and the assignees claiming under, through or in trust for the first party of the building or any part there of, will always respect the right of the second party mentioned in this agreement and in the schedule 'F' in particular.

3. The First party in constructing any flats/apartments/office/ space hereinafter shall sincerely follow the covenants herein contained and shall not confer to exclude from the other owners any burden, expenses to be shared by the second party herein.

4. The documents pertaining to the property shall be handed over to the Owneers' Association on the formation and till that time it shall be retained by the First party.

IN WITNESS WHEREOF THE PARTIES have hereunto set their respective hands the day, month and the year first above written.

WITNESSES :

FIRST PARTY

1.

SECOND PARTY

2.

APPENDIX 3

CONTRACT FOR SERVICES OF AN ARCHITECT

AGREEMENT

This agreement, made this day of ______________________between ____________________________ son of _________________ residing at _________________ hereinafter referred to as Employer, which expression shall unless excluded by or repugnant to the context be deemed to include his successors, representative and assigns of the one part and M/s____________________ Architects having its office at ______________________________________ HEREINAFTER REFERRED TO AS THE ARCHITECT, which expression shall unless excluded by or repugnant to the context, be deemed to include their successors in interest of the other part.

Whereas the employer is desirous of undertaking the construction of _________________ in accordance with general requirements as set out in the terms and conditions stated hereunder; and whereas the ARCHITECTS have agreed to perform the services as set out in the enclosed conditions, upon and subject to their terms and conditions stated hereunder, this agreement witnesseth as follows :

The employer appoints the Architect and the Architect accepts the appointment on the terms and conditions setforth as stated in the foregoing, which condition shall form part and parcel of the agreement.

2. Scope of work.

The Architect shall in the pre-design stage :

i) Visit the site, survey (specify, if required) and collect the site particulars as detailed (in Annexure-1)

ii) Make pre-design study including site evaluation and analysis and environ mental specifications as detailed (in Annexure-2)

iii) Obtain client's requirements and prepare requirement/performance specifications and the architect's brief.

In the concept design stage :

iv) Prepare concept design (single line) drawings, rough cost estimate and obtain client's approval. Prepare preliminary drawings and specifica tions based on the approved concept design of the building and services and indicate the structural system, sizes of structural members and layout and details of services with enough details to prepare the preliminary estimate according to the requirements which shall be incorporated in the prelimi nary drawings and client's approval obtained.

In the submission drawing stage :

v) Prepare the drawings, details and models as required by the local bodies, obtain approval of the client to these, submit the drawings and the documents to the local authorities and obtain approval of the local bodies.

In the working drawing stage :

vi) Prepare and supply the detailed architectural specifications, coordinated architectural working drawings good enough for preparation of the detailed estimate for the building including site development, landscape and layout of the following internal and external services: such as water supply, sanitary and drainage including underground sump, overhead tank, pumping and electrical including substation, roads, paths, compound wall, airconditioning, heating, acoustics, security, lifts and escalators, fire alarm and fire fighting, and telecommunication.

vii) Prepare and supply coordinated detailed working drawings good enough for execution.

viii) Supervise and inspect the work to ensure that the work is being executed in accordance with the approved architectural drawings and specifications.

In the completion stage :

ix) Issue the completion certificate.

x) Obtain the completion and occupation certificate from the local bodies.

xi) Prepare completion drawings for the building and the services.

Other terms and conditions;

The Architect shall

i) When required by the employer, give a list of names of consultants for selection and approval by the employer.

Co-ordinate the work of all approved consultants and be responsible for the complete design, specifications and all engineering drawings prepared and supplied by the consultants engaged by the Architect.

ii) Submit full details of calculations and conceptual designs, including those prepared by the consultants for purpose of scrutiny and satisfaction of the employer as to their correctness.

iii) Prepare preliminary design and estimate and obtain approval of the employer. (Specify this clause, if required).

iv) Prepare the drawings to be submitted to the local body in conformity with the laws, bye-laws, codes and the standards. Submit requisite appropriate drawings and documents to the local authorities and obtain approval of competent authorities after incorporating modifications as necessary and approved by the employer.

v) Prepare the drawings on the basis of site particulars collected by the architect and soil investigation report to be supplied by the employer. The Architect must examine the report and also satisfy himself about the correctness by visiting the site.

In the Working Drawing stage :

The Architect shall

vi) Prepare all architectural working drawing and details for the building, internal water supply and sanitary services as per the requirement of the employer and amending the same, if so desired by the employer and taking into account the functional or structural necessity.

vii) Prepare and coodinate the design of the structure and services (by attending co-ordination meeting) and supplying all necessary information in this regard and incorporate the details in his working drawings, Full size details, where required, shall be prepared for execution and satisfactory completion of work and approval of the employer obtained.

viii) Prepare and supply required comprehensive specifications and drawings to the employer along with reproducible drawing on A-1 size for the purpose of detailed estimate and tender documents.

ix) Prepare detailed desgin and item-rate estimate for the entire work and obtain approval of the employer.

In the Construction Stage

The Architect shall

x) Supply to the employer eight copies of the detailed working drawings and specifications free of charge for use during execution of work along with reproducible drawing of A-1 size.

xi) Prepare and supply to the employer such further drawings, specifications or details which may be required for propper execution of the work.

xii) Visit the size of work at lesat once in a month and provide periodic supervision as and when necessary, co-ordinate the site supervision with other agencies, submit periodic reports on his observations, clarify any decision or interpretation of the drawing and specifications to ensure proper execution of the architectural and releated details. As part of the services, the Architects shall from time to time, certify that their drawings are being correctly interpreted at site and the finishing is of acceptable quality.

xiii) Modify the design and working drawings to meet the reasonable require-ments of the employer without any extra claim of any kind.

xiv) Certify on complain of building that it has been constructed according to the approved desgin and specifications. The form of certificate is as under:

"I/ we do hereby certify that the .... has been inspected on.......... by me and has been completed on .... according to the plans, elevation, sections, details and specifications and architectural items prepared by me and architectural items prepared by me. The work has been completed to my complete satisfacation and the workmanship and the whole of the materials used for finishing items are good."

In the Completion stage :

xv) Prepare necessary completion drawisngs and reports and obtain completion and occupation certificates from the concerned municipal and other statutory bodies (after completion of various components of the projects) and supply three copies of the set of completion drawings and reports together with a set of producible drawings to the employer.

4. Payment of fees

4.1 The employer shall pay total fees at ..... per cent on the cost of work entrusted to the Architect for the services for which the Architect is being engaged by the employer.

For calculating the fees, the following items will not be included in the cost of construction.

i) Cost of land and work not entrusted to the Architect for his services.

ii) Cost of any services like interior designs, moveable furniture and furnishing carpets, works of art etc.. not entrusted to the Architect.

iii) Fees paid to local bodies on any account.

iv) Miscellaneous expenditure (like press advertisement, publicity, inauguration ceremonies) incurred directly by the employer without availing of the services of the Architect specfically for those purposes.

v) Cost of the services not entrusted to the Architect (Mention the list of services, for which seperate consultants are engaged by the employer. Example: drainage, roads, lifts, generating sets, pumps, under ground sump, pumping station, electric substation including installation, other machines and equipment, wet riser intallation, airconditioning equipments, fire fighting services, fire fighting equipments, security, acoustic, telecommunication, fitting and fixtures or any other services) for which the Architect will not be required to do any work except to incroporate such details in his drawing as intimated by the employer from time to time.

vi) Escalation in the cost of work due to increase in rates of materials and labour after award of work to contractors.

4.2 Schedule of payments

Payments made to Architect are on account and shall be adjusted against final fee payable. The Architect will submit necessary bills in duplicate for scrutiny and payment.

	Stage	**Gross percentage of total fees payable by the end of each stage (Net is gross payable less the amount already paid)**
1.	At the end of concept design stage (On completion of sketches and notes sufficient to explain general understanding of the project in accordance with the instructions, discussion and direction of the employer. The items of work include those mentioned at para 2 i to 2 iv)	10%
2.	On completion of preliminary drawings, and model and obtaining approval of employer.	25%
3.	On submitting full set of drawings for obtaining approval from statutory bodies.	35%
4.	On obtaining approval of local bodies.	45%
5.	On completion of working drawings, detailed specifications and details sufficient for preparing an item-rate estimate of cost and tender document.	55%
6.	On submission of architectural detailed and coordinated working drawings and design good enough for execution	75%
7.	During the course of construction (to be paid in three instalments)	90%
8.	On completion of the work, obtaining completion certificate from local bodies and submitting the completed plans to the employer.	100%

For stage 1: The fees shall be calculated on the basis of provision in the rough cost estimate prepared by the Architect and approved by the employer on all-in plinth area basis for the work entrusted.

For other stages: The fees shall be calculated on the basis of approved prelimnary estimate, which in turn, was based on the preliminary drawings.

4.3. The Architect agrees that the fees to be paid as provided in this Agreement will be in full discharge of functions to be performed by him and no claim whatsoever shall be made against the employer in respect of any proprietory rights or copyright on his part or on the part of any other party relating to the plans, models and drawings.

5. Payment to Local Authorities by Employer

All payments to be made to the local authorities will be made by the employer directly to the concerned authorities.

6. Control of the Work

The executive control of the work shall be with the employer or any other person who may be authorised or nominated by him on his behalf.

7. Security deposit

An amount equivalent to 10% of the total amount payable to the Architect shall be deducted progressively from each bill for fulfilling the terms of the contract faithfully and honestly. This will be refunded on submission of completion drawing and obtaining all necessary certificates and clearances from local authorities including fire authorities and issuing the completion certificate.

8. Time schedule

8.1 The commencement of work shall be considered as the tenth day after the date of issue of the letter of award of the work to to the Architect.

8.2 The time for complection of various stages is as under:

Predesign stage	2 weeks
Concept design stage (Preparation of concept design sketches)	4 weeks

Preliminary drawings stage (Preparation of preliminary drawings)	4 weeks
Submission drawings stage (Preparation of drawings for submission to local bodies and preparation of preliminary estimate)	4 weeks from the date of approval by the employer.
Working drawings stage (Preparation of working drawings and details for estimate and tender documents)	4 weeks from the date of clearance from local bodies.
In the construction stage (Preparation of detailed architectural working drawings for construction)	6 weeks

9. Compensation for dealy

The time allowed for carrying out of the work shall be strictly observed by the Architect and shall be deemed to be the essence of the contract on the part of the Architect. The work shall throughout the stipulated period of the contract be proceeded with all diligence. In the event of failure of the Architect to complete the work within the time schedule as specified above or subsequently notified to him, the Architect shall pay as compensation an amount equal to one per cent (or such smaller amount as the employer may decide)on the total fee payable per week of delay, after the specified date at each stage. The maximum amount of compensation is limited to ten percent of the fees paid to the Architect.

10 Additions and Alterations:

i) The Employer shall have the right to request in writing changes, additions, modifications or deletions in the desgin and drawing of any part of the work and to request in writing for additional work in connection therewith and the Architect shall comply with such request.

ii) If the employer makes a deviation from the original scheme which involves for its proper implementation,extra services, expenses and extra labour on the part of the Architect for making changes and additions to the drawings, specifications or other documents due to the rendering a part or whole of his work infructuous, the

Architect may then be compensated for such extra services and expenses on quantum merit basis at percentages applicable under this agreement and to be determined mutually.

iii) The Architect shall not make any deviation, alteration or omission from the approved drawing without prior consent of the employer.

11. Communication :

The Architect should communicate with the employer or his authorised representative only. The Architect shall not in any way communicate correspond directly with or send copies of his letter to the contractor or any office other than the employer or his authorised representative.

12. Abandonment of work by the Architect

If the Architect abandons the work for any reason whatsoever or becomes incapacitated from acting as Architect as aforesaid, the employer may use any or all of the drawings prepared by the Architect. The Architect shall be credited with all fees payable upto the date of abondonment, but he shall be liable to pay compensation to the employer subject to a maximum of ten per cent of the total fees which would have been paid but for abondonment.

13. Termination of agreement :

That this agreement may be terminated at any time by either party upon giving one month's notice to the other and in the event of such termination the Architect shall be liable to refund the excess payment if any made to him over and above what is due to him on the date of termination and employer will be entitled to make full use of all or any of the drawings prepared. In the event of such a termination of the agreement by one party without any default by the other party, the agrieved party shall be paid comensation at the rate of ten per cent of the total fees which would have been paid but for the termination.

14. Arbitration clauses

a) In the event of any dispute, difference or question arising out of or concerning the quantum of fees payable to the Architect or for the execution of the work by the Architect, of the work assigned to him and the dispute cannot be settled mutually, the same shall be referred to the sole Arbitrator appointed by the employer and the Architect. The Arbitration proceeding will be governed by the provisions contained in the Indian Arbitration Act. The decision of Arbitrator shall be final and binding on ooth the parties. Even if any dispute, difference or question arises out of or concerning this agreement and whether the same has been referred to Arbitration or not, the Arhitect shall continue to perform his duties with due diligence and the Employer will make the payment to the Architect according to the Agreement.

b) The request for arbitration should be made in writing within 90 days of the occurrence of dispute failing which the claim will be deemed to have been waived and absolutely barred and the employer shall be dishcarged and released of all liabilities in respect of the claim.

c) Action to appoint Arbitrator shall be taken within one month from the date of communication made in writing by any party to the other party stating that a dispute has arisen and that the matter be referred to abitration.

15. Upon payment of fees as specified in this agreement, the drawing desgin, plans , related details and models prepared and acquired by the architect for the work entrusted to him under this agreement will become the property of the employer subject to copyright privilege. The drawings, desgins, plans,related details and models cannot be issued to any other person, firm or authority or used by the Architect for any other project without prior permission of the employer.

16. The Architect shall indemnify and keep indemnified the employer against any claim regarding drawings, desgins, plans, related details and models prepared and acquired for the work entrusted to him under this agreement and shall bear all costs and expenses incurred by the employer in insuring against such claims.

In witness thereof the PARTIES have executed this Agreement on this day, month and year as written above.

Witness : 1.	Signed for and on behalf of employer
2.	Signed for and on behalf of architect

GLOSSARY

(As referred in the Transfer of Property Act)

Ab - initio : From the beginning.

Attest : To be a witness to a fact. It means that the attesting witness was present at the execution of the deed and can testify that the deed was executed voluntarily.

Absolute ownership : The aggregate of all rights.

Acquisition : Purchase of a property under the Land Acquisition Act or a similar Act under which the ownership is compulsorily acquired.

Agent : One who represents another person or a party

Agreement : A set of promises forming the consideration for each of the parties to the agreement.

Amenity : A pleasant feature adding comfort or pleasure. It adds value to the building but has little value independent of the building.

Annuity : Annual payments to be received.

Assess : Value a property (for an official purpose, such as for tax).

Assignment : Transfer of one's right through a contract.

Attorney : Legally appointed to act in legal or business matters on behalf of another person.

Benami : A transaction under a false name.

Bond : Any instrument (of transaction) by which a person obliges himself to pay money to another person, with or without a condition that the obligation shall be void if a specified act is performed or not performed; as the case may be.

Breach of contract : If a promisor under a contract has neither performed his part of the contract nor tendered his performance or the performance is defective, there is a breach of contract by him. It entitles the other party to file a suit to enforce compliance according to the terms of the contract.

Broker : One who bargains on behalf of someone else and receives brokerage or commission.

Caveat -emptor : Let the buyer take care. It does not mean that he must take a chance. It means that there is no risk , provided he takes reasonable care.

Charge : A right to receive payment out of a property. This right is not transferable.

Charitable Trust : A trust for a public purpose of a charitable or a religious nature. It must conform to the provisions under Indian Trusts Act.

Common Law : It is not codified, but one that grew from custom and case laws.

Company : An association of persons recognised by law to achieve a common objective.

Condition : A restraint.

Consideration : What a promisor is due to get as the price for his promise. In a contract each promise is the consideration for the other party. It excludes natural love and affection.

Constructive Notice : By law, it treats a person who ought to have known a fact, as if he does know the fact.

Contingent : Subject to the happening.

Contract : A legally binding agreement.

Conveyance : An act of transfer. It includes a lease, mortgage, assent, charge, vesting, disclaimer, release of interest in a property by any instrument of transfer except a will.

Co - owners : Persons with a joint ownership.It includes the right to joint possession and enjoyment (except for the purchaser of a dwelling house if he is not the member of the family).

Covenant : A promise (such as, 'the property is free from encumbrance').

Covenants : Terms of an Agreement.

Debenture : An acknowledgement of debt (by a company).

Deed : A legal instrument for transfer of an immovable property.

Defect (in a property) : A defect which adversely affects the physical enjoyment of the property.

Defects (in a title) : These are latent (because the correct and the exact nature of the title is known to the owner only) and are in the nature of encumbrances.

Demise : Transfer by way of lease. It does not include transfer of ownership.

Disclosure : Telling the truth (such as by a seller) as required by law.

Distress : In difficulty, needing help.

Dwelling House/unit : An independent residential house with separate facilities for living, cooking and sanitary requirements.

Earnest Money : It is the security against nonperformance and noncompliance according to the offer and the promise.

Easement (right) : The right of the owner or the occupier of a property to do or not to do something for access or drainage (in, upon or in respect of another property not owned by him).

Encroachment : The extent to which a building or any other part of an immovable property intrudes into a public place or property of some other owner.

Encumbrances : Any burden on the title to a property adversely affecting its market value.

Equity : A right based on the law of natural justice (such as the owner's interest in a property).

Equity of redemption : The right of the borrower to recover the mortgaged property by paying off the debt (even after default but before foreclosure sale).

Estate : A right or interest in an immovable property

Estopped by deed : If one has promised more than he can perform (now), he must make good when he acquires the power to perform.

Exchange (of properties) : Transfer the ownership of a property and acquire the ownership of another property (not owned by him).

Execute : Sign and carry into (legal) effect.

Family arrangement : It defines the title and the share of each member of the family . It does not amount to a transfer of a property

Fee simple : An absolute estate. (It refers to an inherited estate).

Fixture : An item of property attached or affixed to an immovable property.

Foreclosure : A law-suit to get a decree by court to debar the mortgagor of his right to redeem the mortgaged property if he does not pay up the debt within the period specified by the court.

Forfeiture of lease : The lessee loses the leasehold rights (in case the lessee
breaks an express condition which provided that on breach thereof the lessor may reenter).

Fraud : Wilful misrepresentation to gain an undue advantage.

Free-hold : A real estate held in fee-simple or for life.

Future (interest in) property : Such as reversion of property to the lessor.

Future transfer : Transfer of a property in existence but its transfer to take place in future. An agreement to transfer a property not in existence exists as a contract to be performed as soon as the property comes into existence.

Gift : A transfer made voluntarily and without consideration

Gross (as a thing or a right in gross) : Existing independent of anything else.

Heir : One who receives the property of a deceased person by will or by law of descent.

Heir apparent : A would be heir. He has no interest in the property of a person who is still living —even if he would be the heir upon the death of the person to whom he is heir apparent.

Hereditament : Whatever may be inherited.

Homestead land : Site of a building and its surroundings.

House : It is a building on the land together with fixtures and things provided for permanent use alongwith the building.

Immovable property : That which is not movable. It excludes standing timber, growing crops and grass. It includes that which is attached to the earth but does not include otherwise movable ones remaining in position due to their own weights. It includes the land, the building, any improvement therein and any right or interest in the property.

Improvements : Buildings, services, amenities and any construction to increase the value of a property. Repairs are not improvements unless the market value of the building increases significantly as a result of the improvements.

Instrument : A writing containing a contract. It includes all nontestamentary instruments but excludes a ' will'.

Interest in property : Ownership is a bundle of rights. Each right is an interest.

Invalid transfer : Transfer forbidden by law or contrary to public policy.

Khata : A ledger an account of lands maintained by the authorities.

Land (Key word) : An immovable property excluding the building.

Lessee : A person who acquires the rights to enjoy a property under a lease.

Lessor : Transferor of the right under a lease.

Liability : Legal responsibility.

License : Permission to use (given to a person) subject to the possession and control remaining with the owner.

Lien : A claim enforceable by law.

Limitation : Words used to limit or define the nature of a limit

Les-pendense : A legal notice to take note of (the warning).

Marketable title : A title free from reasonable doubt and having a valuable consideration.

Mesne-profits : Right to sue on account of unliquidated damages.

Metes and bounds : Legal description of a property defined by measurements (metes) and directions of boundaries (bounds).

Minor : A person who (according to the personal law to which he is subject) has not attained the majority (age).

Mortgage : Transfer of an interest in an immovable property as a security for repayment of debt. It is treated as a transfer of an interest in the property.

Mortgage by deposit of title deeds : The purpose is to create security for the mortgage.

Mortgagee : The transferee of a mortgage.

Mortgage money : The principal money and interest secured by mortgage.

Mortgagor : Transferor of a mortgage.

Notice : A writing intended for the receiver to take cognisance.

Novation : Extinguishing the liability under an existing contract and substituting it (with a different liability under a new contract).

Offer : Proposal. An agreement contains an offer by one party and its acceptance by the other party.

Owner : A person entitled to receive profits of the property in connection with which it is used or disposed of . It is the party or the person in whose name the property stands registered (under the Indian Registration Act).

Ownership : A bundle of rights.

Partition : Surrender of the joint ownership right in favour of a right of individual ownership of a part of the property.

Patta : A document of engagement between an erstwhile zamindar (collector of land revenue) and his tenant.

Possession : To hold as the owner (or as if the owner). Actual possession is the notice (to the intending purchaser) of title.

Power of attorney : Any instrument granting authority to an agent to act for and in the name of the person executing the power of attorney.

Premium (in a lease agreement) : A part of the consideration for being let in possession.

Proposal : A promise or set of promises. An agreement contains a proposal and its acceptance.

Real estate : Land and building (any improvement) on the land.

Recession : To rescind a contract.

Redemption : Recover a property by paying the amount of the mortgage plus interest due and the foreclosure costs.

Registered : Registered as prescribed in the Indian Registration Act, 1908. Registration is the notice (to all) of the registered instrument (of transfer etc.).

Relinquish : Give up. It does not amount to alienation unless so qualified.

Rescission : To rescind a contract.

Restricted interest : Right (interest) restricted to a specified person for enjoyment. Such a right (interest) is not transferable.

Restrictive covenant : A private restriction on the enjoyment (occupancy and use) of a property.
Reversion : It is the reversion of the property in future to the owner, such as on the termination of a lease.

Revocable Transfer : A transfer reserving the right to revoke the transfer.

Right : Legal claim (to ensure compliance).

Right of way : Easement right to go across the land of another owner.

Risk : Probability of loss on investment.

Settlement : Nontestamentary disposition in writing (of a property).

Share (undivided) : Proportionate interest of a co-owner in a property. When an immovable property is sold to two or more persons jointly, they are entitled to interests in the property in proportion to the shares of the consideration.

Specific performance : If an agreement for the sale of an immovable property exists, Courts of law grant specific performance of it under the provisions of the Specific Relief Act, 1963.

Specialty: A contract made by a deed (eg a mortgage)

Statuary : By law

Stridhan : Property held by a Hindu woman subject to no restriction for gift, sale or otherwise.

Sublease : The lessee of a property may, in turn, further lease out a part or the whole of his rights in the property. The latter lease is a sublease.

Suit for sale on mortgage : The legal process to assert the right to sue for the mortgage money by sale of the mortgaged property.

Tenant : One who holds the premises on tenancy (or lease for a term less than twelve years) from a landlord and who is protected from eviction under the Rent Control Act.

Tenement : Anything of permanent nature that can be held in possession. Usually it means buildings.

Terms : Conditions of a contract.

Testament : Declaration in writing. That in which attestation is made.

Title : Ownership of an immovable property.

Title deed : Documentary evidence and proof of ownership.

Transfer : Convey a property, now or in future (in terms of the provisions in the Transfer of Property Act).

Transferee : To whom the property is transferred.

Transferor : One who gives away the rights of ownership of the property to another.

Undivided family : A family whose members are the co-owners of the property belonging to the family.

Unlawful object : An object whose transfer (by the parties to an agreement) is prohibited by law.

Value of improvements : Increase in the market value of the property due to improvements.

Vendee : Buyer

Vendor : Seller

Vested interest : Interest vested by transfer. When an interest is vested, the transfer is complete.

Will : A document determining the disposition of the property after the death of the owner.

(As referred in the Apartment Ownership Act and Ownership Flats Act)

Apartment (Key word) : A separate and self contained premises (being part of a building) useful for residence, office, show room, shop orgodown. A part of the building which can be occupied independent of the rest of the parts. However, it may be accessed through a common area.

Common facilities : Common facilities listed in the declaration or under the Act/Rules/Bye-laws.

Undivided share (in common areas and facilities) : Same as the undivided share in the land. It equals the ratio of the value of the apartment to the value of the immovable property as a whole.

Co-operative Ownership: Ownership of shares in a co-operative society entitling the owner to occupy or use a plot of land, a flat or an apartment.

Flat (Key word) : Apartment.

Occupancy Certificate: Permission of the local authority allowing occupation of a building.

Promoter: One who constructs a block of flats or apartments for selling some or all of them.

(As referred in the Town Planning Act, City Development Control Rules and National Building Code)

Access: The means of access or approach to a property.

Accessory building : A building, separate from the main building on a plot of land and meant to accommodate one or more accessory uses.

Access road : Means of exclusive access, not less than 3.5 metres wide and not more than twenty metres in length from the existing public road or street.

Act : The relevant Municipal Corporation Act, Town Planning Act or the Urban Development Act.

Agriculture land : It includes land use for horticulture; poultry farming; raising of crops, fruits,vegetables, flowers, grass or trees; breeding of live stock, fish; bee-keeping; pasture for grazing cattle and for any purpose ancillancy to cultivation or other agricultural purpose.It does not include land used as a garden which is an appendage to a building.

Air-condition : Provide a building with an equipment to treat the air inside the room so as to control its temperature, humidity and cleanliness (simultaneously). The process also includes distribution of treated air.

Addition/ Alteration to a building : It means addition /alteration of the cubic contents or the floor area of a building (Depending on the Act, it may or may not include a change from one occupancy to another).

Automatic fire-alarm system : A system designed to activate automatically the alarm in case of fire and automatically activate the fire fighting system to discharge water upon the fire.

Automatic Sprinkler System : Piping and water sprinklers activated automatically by the heat of fire.

Balcony : A floor above the ground, projecting beyond the wall, with a handrail or balustrade and serves as a passage or sitting out place.

Basement : Building or storey, partly or wholly below the ground level. (The height of basement should not project more than one metre above the average ground level).

Building : Any structure with a foundation, walls, floor, roof or any wall enclosing a land or a space.

Building, assembly type : A building where a large number of people frequently gather.

Building code : National Building Code or local bye-laws as applicable. They promote safe building practices.

Building, detached type : A building with walls and roof separated from other buildings by open spaces alround.

Building, height of : In the case of a flat roof, the vertical distance from the average ground level (around and contiguous to the building) to the highest level built. In the case of a pitched roof,the height upto the mid-point between the eaves level and the ridge level.

Building, high-rise/ multistory type : A building with more than three floors excluding the ground floor and with a height more than 15 metres.

Building, institutional type : A building permitted for use as an institution and used as such for the care or benefit of the public.

Building line : The line (adjacent and parallel to the street) upto which the plinth of a building may lawfully extend.

Building, public type : A building owned and used by the Government or a semi-Government authority, public registered trust or such other public body for public purposes such as public worship, health or education.

Building,residential type : A building meant for residence in which sleeping accommodation is provided. It includes single or multi-family dwellings, apartments, flats and rooms used for lodging, hostel or dormitories.

Building,semidetached type : A building with open spaces on three sides. (A combination of two buildings into one on a single plot, with each building having open space on three sides).

Built-up area : Areas covered by a building at and above the plinth level including the external areas of upper floors (but excluding the areas excluded for the purpose of Floor Area Ratio)

Bye-law : The law of a local authority (generally relating to control of the development of an urban property in a town or a city).

Carpet area : The net floor area within usable rooms excluding the area of walls.

Chajja : An overhang provided over an opening on an external wall for protection from sun and rain - to the space enclosed by the wall.

Comprehensive/ City Development Plan: Plans prepared by the Planning Authority showing the proposals for the development of an area or the city as a whole and approved under the Town Planning Act.

Commencement certificate : Permission for development of a land subject to the conditions referred in the certificate.

Congested area : Existing congested areas as shown in the zonal maps. It may include existing Gaothans (villages) within the municipal limits.

Conversion : Change of the land use or type of occupancy permitted by the authority as stipulated in the Master Plan.

Corner site : A site (plot) at the junction of (and with frontages on) two roads.

Courtyard or chowk : Enclosed ground attached to a house. A space permanently open to the sky, enclosed fully or partially by the spread of a building.

Covered area : Ground area covered by a building and measured immediately above the plinth level.

Depth (or Length) of a plot : The mean horizontal distance between the front and the rear boundaries of a plot of land.

Development : Construction, addition or alteration of buildings; engineering or other operations in, over or under land or in the use of any building.

Development Authority : It is the Authority constituted by a state government for development of an undeveloped notified area.

Development Charge : The charge levied by a Local Authority on the owner of a land for change of land use.

Development Control Rules : Rules framed under a State Government Act to control the development of urban properties in a city or a town.

Development plan : The plan for development of an area within the jurisdiction of a Planning Authority.

Double Frontage : With frontages on the roads on front and rear (or on opposite sides).

Drain : A channel to carry rain water, sewage or waste water.

Drainage : The system for removal of water

Enclosed Staircase : A staircase separated by fire resistant walls and doors from the rest of the building.

Existing building (or use) : A building (or use) existing (before the commencement of the bye-laws) and legally permitted.

Exit : A passage from any building, story or floor to a street or other open space of safety.

External services : It includes laying out of a road or means of access to a road and laying out of means for water, drainage, electricity and other public services.

External wall : A wall abutting a space open to the sky.

Fire (or emergency) alarm system : An automatic or manual device to alert the occupants in the event of a fire (or emergency).

Fire Lift : A lift specially designed for use by fire services personnel in the event of a fire in the building.

Fire check door : A door or shutter to withstand a fire for a specified duration and check the spread of heat and fire through the door.

Fire resistance : Resistance of a building component to withstand the fire without collapse thereby preventing the passage of fire and reducing the passage of excessive temperature to the other side for the specified duration as tested in accordance with IS: 3809.

Fire separation : The distance upto the building from any other building or a street or a public space.

Floor : The bottom horizontal surface of use in a story, used for walking, sitting and sleeping.

Floor area : Covered area of a building at any floor level.

Floor Area Ratio (F.A.R) or Floor Space Index (F.S.I) : The ratio of the total covered area (plinth area) on all floors (excluding exempted areas) to the area of the plot. (According to the bye-laws of the Local Authorities, the floor area generally excludes the area used for car parking, staircase rooms, ramp, escalators, ducts, water tanks, main sanitary duct, open balconies and machine rooms).

Foundation : The part of a building which is in direct contact with the ground and transmits the loads to the ground.

Foundation, shallow : A foundation whose depth is less than the width and hence the shear strength of the soil above the foundation level is neglected.

Gaothan (village) : Relates to the tenure of the land according to the land record and means village areas free of assessment for municipal tax.
Garage : A building or a portion thereof designed and used for parking of motor driven or other vehicles.

Ground level: Average level of the ground around and contiguous to the building.

Group housing : A group of dwelling units on a single plot of land. Usually the minimum area of a plot to be eligible for group housing is specified.

Land use : The principal use of the land and the building thereon as legally permitted according to the bye-laws of the Local Authority.

Landuse Plan : Map indicating the land uses in different zones.

Length (or Depth) of a plot : The mean horizontal distance between the front and the rear boundaries of a plot of land.

Licensed architect, engineer or plumber : A qualified architect, engineer or plumber (as the case may be) who has been licensed by the Local Civic Authority for the specified purpose in connection with the preparation of the plans for approval of the Local Civic Authority and the supervision of the construction of the building according to the approved plans.

Lift : A moving compartment transporting persons (or materials) vertically between floors of a building.

Living/habitable Room : A room meant to be occupied for hours together for living including sitting, sleeping, cooking but excluding bath, water closet, storage and passage.

Local Authority : City Corporation, Municipality, Zilla Parishad or any other Authority so designated under the Town Planning Act.

Loft : An intermediate space with a clear height not exceeding 1.50 metres created by providing a floor slab between two successive habitable floors or between the floor and the roof and used for storage purposes only.

Master Plan : Comprehensive development plan prepared by the Planning Authority showing the proposals for the development of an area or a city and approved under the Town Planning Act.

Mezzanine floor : A habitable intermediate floor with less than normal story height. The minimum story height of a mezzanine floor is 2.2 metres and the total mezzanine floor area is generally limited to one third the area of the floor below.

Neighborhood : It is the smallest geographical area inhabited by people with similar levels of income, real estate or type of business.

Occupancy (use) : The predominant type of occupancy for which a building (or part of a building, as the case may be) is used or intended to be used.

Occupier : A person in lawful occupation of a premises and who is liable to pay compensation to the owner for use and occupancy.

Open space : A part of the area of a plot of land left open to the sky.

Parapet : A low height wall or railing built above the roof (or floor) and along its edge.

Parking space : An area sufficient to park motor vehicles. It includes the driveway from the road (or access road) to the parking space.

Partition wall : An interior non-load-bearing wall of any medium constructed in a building.

Party wall : A wall separating adjoining buildings or flats (apartments) belonging to different owners or occupied by different families.

Planning Authority : An Authority constituted under the Town Planning Act for the purpose of planning for development and use of land in a notified area.

Plinth : The part of a building between the ground and the floor immediately above the ground.

Plinth area : The total built-up covered area measured externally at plingth level and at the floor levels.

Plot : A piece of land, held in one or joint ownership and with definite boundaries. It is given a number for identification and is acknowledged as one plot by the town planning authority.

Porch : A space covered by a structure supported on pillars or otherwise and used to shelter the pedestrians or vehicles at the entrance to a building.

Residential (building): A building used for human habitation with provision for sleeping. It includes gardens, grounds, garages, stables, outhouses and other accessory buildings appurtenant to the main building with the sleeping accommodation.

Road : A road, over which the public have a right of access.

Road (street) level : Level of the centre line of the road in front of the midpoint of the frontage.

Road (street) line : Boundary line of the right -of -way of the road.

Road width : The perpendicular distance between the boundaries of the right of way of a road (or street) measured at right angles to the direction of the road at the midpoint of the frontage of a plot. (The public have right of access to every part of the right -of -way of a road).

Room : A compartment of a building which can be used and secured as a separate enclosure.

Room height : The vertical distance from the floor to the underside of the ceiling or the midpoint of the sloping roof surface.

Row housing : A row of houses with open spaces on the front rear and interior only, but with no open to sky passage from front to rear, to the adjacent building.

Service road : Road or lane on the front, rear or side of a plot to provide services for a building.

Setback line : A line parallel to the centre line of the road and beyond which the plinth of a building can not extend towards the road.

Sewerage : The system of pipes conveying sewage.

Site (or Plot) : A piece of land, enclosed by definite boundaries. Generally it has a plot number for identification and is acknowledged as one plot by the Town Planning Authority.

Site, intermediate type : Any site other than a corner site.

Slum : A neighborhood with occupants, but without legal title to occupancy.

Soil pipe : A pipe conveying the discharge from the water closet or the urinal.

Stilts : Ground storey of a building without any enclosure. (It is used for parking vehicles only).

Storey : The portion of a building between the surface of a floor and the surface of the floor next above it.

Structure : The structural system of the components of a building supporting the loads.

Tenement : An independent dwelling unit with provision for sleeping. It means a house.

Town Planning Authority : Planning Authority for a town or a city duly empowered under the Town Planning Act.

Town Planning Scheme : A planning scheme prepared by the Town Planning Authority for the development of an area.

Unsafe building : A building whose structure is unsafe and constitutes a danger to human life.

Verandah : A covered ground floor area with at least one side abutting an open space.

Waste pipe : A drainage pipe conveying waste water but not swage.

Waste Water : the liquid effluent from a building but excluding sewage.

Water seal : Water in a trap which can prevent passage of air through the trap.

Water closet (W.C.) : A pan to receive human excreta and flushing out the same with water. It also means a room with a water closet in it but does not include a bath room.

Water course : A natural or artificial channel to carry the storm water and the waste water from the different localities of a city.

Zone : A division of a city as a planning district. Such a division may be based on population density, land use or unit of development.

Zoning : Division of a city or a town into planning districts, each with a distinct set of development control parameters.

Zoning map (Zonal Development Plan): A map showing various zones, permitted land uses and existing and proposed developments.

(As referred in the National Building Code and National Electrical Code) (for services in buildings)

Air-change : Volume of outside air getting into a room per hour.

Air-to-air resistance : Resistance of a body to the flow of heat due to its thermal conductivity and resistance of both surfaces. It is the reciprocal of the U - value.

Altitude : Angular distance of an object in the sky measured above the horizon.

Cable : Electrical conductors, each insulated , but grouped together with overall insulation.

Circuit : A loop formed by an electric conductor to convey electric current through the loop and thus forming an electric system or a branch of the system.

Climate : Prevailing (atmospheric condition)It is the mean of the temperatures, humidity of air, sunlight and velocity of wind, each calculated from the actual measured over the years in the recent past.

Climate, urban : Climate affected by urban environment.

Climatic zone : A region experiencing a particular type of climate. (The zones are - hot and arid, hot and humid, warm and humid and the cold).

Conductor : A material which allows electric current to pass through it continuously.

Cut-out : A device to automatically and instaneously cut off transmission of electric current through a conductor when the current rises above a predetermined level. Examples - fuse, cut-out.

Daylight factor (sky component) : Ratio of illumination from sunlight at a point in a building and on a horizontal plane to that at an exterior point exposed to the sunlight from the whole clear (design) sky.

Dry-bulb temperature : It is the actual air temperature measured by placing the dry bulb thermometer in the shade.

Dry riser : A vertical water pipe inside a building with an inlet at street level and outlets at each floor level.

Earth-continuity conductor : A conductor connected to the earthing lead and to each of the parts of an installation required to be earthed.

Earth-electrode : A metal plate, pipe or other conductor buried in the ground and thus electrically connected to the earth. (Conductors connected to the earth electrode dissipate the current into the earth).

Earthing : Connection of an electric systeme to the general mass of the earth.

Earth fault : Accidental passing of electric current from a conductor to the earth.

Earth leakage circuit breaker (E.L.C.B) : A fast acting circuit breaker that detects even very low level ground fault currents (even those which accidentally pass through a body of a person standing on a damp ground while touching an insulated but not a conductor carrying alternating current). It breaks the circuit whenever there is a fault causing a ground current in excess of the limit which is harmful to persons and equipment. They do not provide protection against higher than normal voltage supply. (Low level currents can not be detected by normal circuit breakers or fuses).

Earth leakage current : Current flowing from a conductor to earth due to failure of insulation.

Earth wire : Earth continuity conductor. It ensures earthing.

Effective temperature : Effect of actual temperature, humidity and air movement measured as equivalent temperature of still and saturated air.

Electric fault : An abnormal flow of electric current from a conductor to the ground or to another conductor (due to the failure of insulation).

Emissivity : Ratio of heat emitted by a body from its surface to that emitted by a body from a perfect black surface.

Footing (Spread foundation) : A foundation spread at the base of a column or a wall.

Hardness, surface type : Resistance of a surface to scratching (abrasion). It may be measured in Moh's scale (1 to 10). The hardens of diamond is 10 and that of talc1.

Generator : A machine moved by mechanical energy and producing electricity.

Glare : Contrast in illumination or excessive light in the line of sight causing visual discomfort.

Gully trap : Pipe fitting with a water seal to prevent passage of undesirable matter, but allow flow of waste water.

Humidity, absolute : Weight of moisture (water vapor) in unit volume of air.

Humidity, relative : Ratio of actual amount of moisture in air at a given temperature to the amount of moisture it can hold, when the air is saturated at the same temperature.

Illumination : Level of light measured in lumens per square metre (lux) incident upon a surface.

Insulation fault : Drastic reduction in the resistance of the insulation.

Live wire : A conductor carrying electric current.

Lumen : Light emitted within unit solid angle by a point source of light having a uniform intensity of one candela.

Miniature Circuit Breaker (M.C.B) : A compact device for making and breaking an electric circuit in case of an overload current or a short circuit.

Modulus of rupture : Capacity to resist rupture due to bending or twisting. Ratio of stress (withstood) to strain (ratio of alteration in dimension to original dimension) at the point of rupture.

Motor (electric type) : A machine moving by using electricity and having a capacity to do work.

Overload electric current : Operation of an electric equipment at a load greater than its designed load thus causing excessive current for a sufficient time to cause overheating and other damages.

Pile foundation : A foundation supported on a series of piles and thus transferring the load to much greater depths below the foundation level than by a shallow foundation.

Power factor : Ratio of useful power required by an equipment to the total power required including the reactive power. (The electricity supplying authority requires that the power factor of the electrical installation at the consumer's premises be not less than 0.85).

Raft foundation : A reinforced concrete slab covering the entire area of the building and transmitting the loads to the soil over the entire area instead of the bases of the columns and walls alone.

Reflectivity (reflectance) : Ratio of the quantity (of light, heat or sound) reflected from a surface to the total quantity (of light, heat or sound) incident upon it.

Rot : Decay of wood (timber) caused by fungi or other micro-organisms.

Sand : Cohesionless soil with fifty percent or more particles of grain size less than 4.75 millimetre, but more than 0.075 millimetre.

Sewage : Liquid waste containing human excreta or industrial affluent.

Shade factor : Ratio of total instantaneous heat gain through a shading device to the heat gain through a three millimeter thick plain glass sheet.

Short circuit : Accidental electric connection of two points at different potentials into one point (that is through negligible resistance or impudence).

Silt : Soil with very little or no plasticity and particle size 0.075 millimetre to 0.002 millimetre.

Sound insulation : Resistance to passage of sound through a partition. It is measured by the difference in the sound levels on the input and output sides of the partition.

Surface resistance to heat : Ratio of the heat reflected back from the surface to the quantity of the total heat incident upon the surface.

Surge arrester : An electric device to protect electric equipments from high transient voltage.

Switch gear and control gear : Switching device used for a generation, transformer, or a motor.

Thermal conductivity : Quantity of heat flowing by conduction per second through unit area of a material and of unit thickness, when a unit temperature difference is maintained between its two surfaces.

Thermal conductance (U - value) : Quantity of heat flowing through a body (material and both the surfaces) through unit area when a unit temperature difference is maintained between its surfaces.

Thermal resistivity : It is the reciprocal of the value of thermal conductivity.

Transmittance : Air-to-air transmittance of heat or sound through a solid body. It is the reciprocal of air-to-air resistance. In the case of heat, it is the conductance (U - value).

U - value : Rate of heat flow through unit area of a body by incidence on one surface and exit from the opposite surface.

Vapor pressure : Pressure of water vapor inside a body.

Vapor resistance : Resistance to the movement of water vapor through a body.

Ventilation : Flow of outside air into a room and of inside air to outside.

Water absorption : Ratio of the weight of water absorbed by a body to its dry weight. It is usually expressed as a percentage.

Wet - bulb temperature : Air temperature measured by the thermometer with its bulb cooled by covering it with a moistened gauge or muslin cloth and placed in air with a velocity of not less than 4.5 metres per second.

Wet riser : Water main inside a building meant exclusively for firefighting with inlet at ground level connected to a fire hydrant or an automatic pump and with outlets at each floor level.

Wind direction : Prevailing direction of the flow of wind. (A variation of upto 25 to 30 degrees does not materially affect the ventilation).

Working plane : The horizontal plane on which work is generally done by human beings. It is about 85 centimetres above the floor.

(As referred in Development and Valuation of Urban Properties)

Anesthetics : Relationship between form and utility to produce a pleasing perception through the senses - visual and tactile (sense of touch).

Basic function (key word) : A utility for which the buyer pays. It is the essential function that the building component must perform to satisfy the performance requirement of the user. Thus each alternative product for a building component must perform this function.

Bearing pressure, allowable : Maximum net load per unit area (after deducting the weight of the soil removed) that a building can impose on the foundation without causing excessive settlement or shear failure.

Benefit : Satisfy a need and a want. Thus benefits are valuables. An economic advantage. Thus every benefit has a value.

Brief specifications : Specifications to define the type of a building for construction or value.

Class (of land or building) : Very Important Persons (V.I.P.). High, Middle or Low Income Group.

Capital : Financial and material resources used for a business.

Capitalization : Discounting of expected future incomes to obtain the equivalent present lumpsum amount.

Cashflow : Cash receipts and expenses in a given period.

Characteristics : Inherent and essential features defining the distinctive nature (of a property). (A prospective buyer may not want every characteristic feature that exists. Hence every characteristic is not a benefit).

Clay : Soil with plasticity and grain size less than 0.002 millimetre

Soft clay : Clay with a high natural water content which reduces cohesion between soil and water . It can be moulded with fingers. It can be excavated with a spade.

Stiff clay : Clay with a very low natural water content and thus high cohesion between soil particles. It cannot be excavated with a spade.

Coefficient of friction : Ratio of the force of resistance to movement along a (horizontal) plane to the weight of the body making an effort to move.

Contingency : The amount provided in an estimate to meet the unforeseen, but likely expenses during future construction.

Cost : Price paid or expenses incurred.

Cost Index : A number expressing the relative cost with reference to the cost in a particular city or at a particular time (or both).

Customer : Prospective buyer.

Data : Information (fact or facts) given (jnput).

Decibel : One-tenth of a bel. A bel is the ratio of the sound pressure level of the receiver to the sound pressure level of the source.

Economic life (key word) : Beneficial life period (of a building or its component). The period during which the economic return from a property is more than the expenditure on its maintenance and upkeep. The period upto which it is more beneficial to keep the building (or the component, as the case may be) than to dismantle and redevelop it.

Environment (of a property) : Physical disposition of the surrounding (including the weather) social-economic setup and the politico-legal setting.

External services : In the case of a building, services outside the plinth area of the main building. In the case of a flat (apartment), services outside the flat.

Fair market value (key word) : The price at which a property can be sold in an open (not being a closed or restricted) market. It is the price that a prudent and willing buyer would pay for the property.

Feasibility : Analysis of a proposition to ascertain the probable net benefit.

Function (of a building or a component) : Perform to achieve the purpose.

Function, basic type : See basic function.

Function, secondary type : Neither required nor paid for by the user, it is the function performed as an accessory to the corresponding basic function. Usually such a function is required as a part of the design only on technical considerations. Not being a user's requirement, it may not be performed by a certain alternative product and yet it may perform the corresponding basic function satisfactorily.

Functional efficiency : The ratio of the functional worth to actual cost.

Functional worth (key word) : Lowest cost at which a given basic function can be performed.

Highest and best use (of a land or building) : Best use to achieve the highest market value.

Internal rate of return (I.R.R.) : Rate of return on investment at which future cashflows are discounted so that the present value of the future cash inflows becomes equal to the present value of the future cash outflows. This makes the net present value zero.

Investment : Capital provided to get income or profit over a long period.

Locality (Key word) : Part of a city with a name for the locality whose inhabitants share the same civic amenities. It is surrounded by well defined natural or manmade boundaries on all sides.

Location : Position of a property in relation to its neighbourhood.

Market : The group of buyers and sellers.

Market approach to value (key phrase) : Procedure to determine the fair market value of a property from the sale prices of similar properties.

Market study : A study to assess the demand and supply.

Market survey : A detailed investigation (including survey and interviews) to ascertain marketability.

Market value : Price at which a property can be sold.

Masonry : Bricks or blocks bonded together with cement and/or time mortar.

Net present value (N.P.V.) : Difference between the present values of future cash inflows and the future cash outflows.

Noise : A level (decibel) of sound producing undesirable psychological or physical effects on a person's ear.

Obsolescence (partly or wholly) : Being no longer beneficial.

Passage : Area exclusively meant for passage (access, entry and exit).

Performance specifications : User's requirements.

Planning Efficiency : The ratio of work area (plinth area less area of passages and walls) to the total plinth area.

Plinth level : Ground floor level.

Present value : Present monetary value of future income.

Productivity : Capacity (of an immovable property) to provide valuable benefits.

Property : A physical entity bestowing a bundle of rights.

Rehabilitation : special repair to restore partly, the life of a building.

Salvage value : Value of a building after its demolition. It is the value of a building after its economic life.

Shear strength : Capacity to resist, shearing, sawing, and cutting.

Standard specifications : Specifications generally followed for the particular type of the building.

Superstructure : Structure of a building above the plingth level.

Supply : Quantity offered for sale.

Survey (of a property) : Detailed investigation including measurement of the dimensions and collecting all the information that affect the value of the property.

Topography (of a land or its neighborhood) : Physical features.

Type (of building) : Superior, High, Middle or low Income Group.

Urban property (Key word) : Property in a city.

Utility : Ability to satisfy a human need. Usefulness.

Valuation : To estimate the value.

Value (key word) : Economic worth of a property measured by its capacity to satisfy the need.

Value analysis : Analyse market value for functional worth to cost (ratio).

Value engineering : Design to maximize value and minimize cost.

Work area (of a building) : The net area after deduction of the area of passages and the walls from the plinth area.

Yield (of a property) : the periodical income.

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