NATIONAL SYMPOSIUM ON

PROFESSIONAL PRACTICE FOR ARCHITECTS

Under the Auspices of

COUNCIL OF ARCHITECTURE

(Statutory Body under the Architects Act, 1972)

THEME DOCUMENT

On Saturday 15th March, 1997

At Birla Kreeda Kendra, N. A. Purandare Marg,
Chowpatty, Mumbai - 400 007

Organised by :

Practising Engineers Architects and Town Planners Association
306, VIKAS, 3RD FLR, 11, NYAYAMURTY G.N. VAIDYA MARG
(11, BANK STREET), MUMBAI 400 023. INDIA • PH. 266 1181

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Please Note :

Views expressed in the documents are not necessarily those of the Council of Architecture or Practising Engineers Architects & Town Planners Association (PEATA).

FORWARD

In a meeting of Council of Architecture organised and sponsored by P.E.A.T.A. at Lonawala. a desire was expressed that a symposium be arranged to evaluate the present practice system. Accordingly P.E.A.T.A. offered to organise a symposium which was accepted by the Council of Architecture for which we are thankful to the Council President Shri J. R. Bhalla and Executive Committee of the Council.

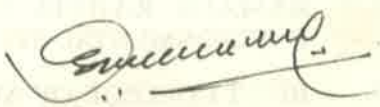
The Symposium is an attempt to address and evaluate the varieties and changes that have emerged in last 2 or 3 decades due to various social, economical and statutory changes. Change is a part of life nothing can remain stagnant so also the practice. From the Concept of Frozen Rent in 1740 to 15% net return at present is one of such changes. Other changes like U.L. (C. & R.) Act etc. has created a definite impact on the development. Emergence of new vocations. specialisation and requirement as well as expectation of the society from the professionals have undergone tremendous changes.

Being on threshold of 21st century, in the age of Liberlisation, Globlisation and Computerisation, new challenges, new concepts and new approaches to practice are bound to emerge which require evaluation and assimilation in practice and statutory format.

The Symposium is an attempt in that direction and it is hoped that meaningful discussion and consensus on various issues will emerge.

While thanking all those who have worked, participated, sponsored and contributed towards this symposium I have the great pleasure in presenting the Theme Document for an instructive and educative deliberations in the interest of profession & society at large.

Yours Sincerely,



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SESSION I

EMERGING CHANGES IN ARCHITECTURAL PRACTICE

PANELISTS

SHRI SATISH C. DHUPELIA

SHRI NATUBHAI BADHEKA

SHRI AKHTAR CHAUHAN

EMERGING CHANGES & OPPORTUNITIES IN ARCHITECTURAL PRACTICE

1 OPPORTUNITIES & EMERGING CHANGES

The design and building of structures for the purpose of making life more pleasant has been going on for a long, long time. Primitive man learned to pile stones and logs at the mouth of his cave as a protection against the weather and wild animals. He became a 'master builder' through necessity, but his practice was limited to his own requirements and by few materials. As civilization developed, more materials were used, but not until the 1800s did conditions require any specialization in design.

Wars would normally not be considered advantageous. However, wars seem to generate a need for new materials, and after World War I and World War II there was a flood of them put on the market. Along with this increase in the number of materials came an increase in the responsibilities of the architect-engineer. He was becoming a business man as well as a specialist. In many cases the A/E had to learn the "business" end by experience, and the future will bring an even greater need for business acumen.

The present type of operation makes it virtually impossible for one person to be fully informed, and the architect or engineer, starting his own office, must eventually assemble a team to work with him. Therefore a judgment must be made to either be the team leader or one of several important specialist that complete the team.. Even if the A/E elects to maintain a small "one-man" office, there is a continuing requirement for consulting services. Regardless of the ultimate position, the active A/E must operate at a profit-if he is to survive.

1.1 OPPORTUNITIES

A variety of assignments, duties and career paths awaits the aspiring & Practicing Architect/Engineer. He may be involved in any of the following work areas :

Preliminary conceptual study of the facility to be constructed to determine the optimum size, nature, and type of components.

Rate, financial and economic studies, value engineering, and other management services.

Final design, including calculations, the preparation of plans, materials and equipment specifications, and contract documents.

Review of equipment and materials proposed by the contractor, or assisting with

on-site inspection during construction.

Assistance with operation of the completed facility.

This is, of course, an incomplete listing, but it indicates the diversity of activity open to Architect/Engineer. As the young Architect/Engineer gains experience and expertise, his level of involvement and responsibility also increases.

1.2 RELATED SPECIALTIES

Variety is intrinsic to the activities of the Architects/Engineer in private practice. It is this variety that makes this field of endeavor so alluring to professional Architects/Engineers of all ages and levels of experience. To some extent, these can be broadly, but not exhaustively, listed as under :

Basic Design Service
Total Design Services
Comprehensive Services
Project Management Services
Construction Management Services
Liasoning Services (Local, State & Central Govt. Approvals)
Turn-Key Assignments
Design & Build Services
Repairs & Restoration assignments
Interior Design
Land & Building valuation (Tax Related & Finance Related)
Arbitration
Construction Audit
Infrastructure Planning & Design (on site-off site)
Photogrammetry & Satellite Imaging
Environmental Control and assessment

All of these specialties involve things constructed in some manner. In fact, some of those listed are basic building blocks for other specialties. These building blocks would include structures, soil and rock mechanics, engineering mechanics, hydraulics, and surveying and mapping. One or more of these building blocks are generally associated with specialized knowledge to create a specialty field in Architecture/Civil engineering. For example, water supply, treatment, storage and distribution would include essentially all of the building blocks plus the specialized knowledge of processes for treatment of water. Similarly, pumping stations would include structures, soil and rock mechanics, and hydraulics, along with specialized knowledge concerning pumps, motors, and ancillary equipment.

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In addition to these specialties, Architecture/Civil engineering is interrelated with all of the other major disciplines, and so the accomplished consultant must acquire knowledge and experience in those disciplines as well as his own. On many multidisciplined projects, Architect/Civil engineer coordinates the efforts of all the Consultant groups, including electrical, mechanical, chemical, and various other types of engineers, to ensure proper completion of the project. The use of the full range of building blocks, plus specialized knowledge in many other related areas, provides the Architect/Civil engineer with a broad base of knowledge and experience.

1.3 SPECIALIST VERSUS GENERALIST

As an Architect's/Engineer's career unfolds, he must decide, at some juncture, whether he wishes to be a generalist or a specialist. Some choose to concentrate on only one of the aspects and become specialists. These individuals advance in their field and become specialists. These individuals advance in their firms on the basis of their ability to do the work involved in only certain aspects of a project, such as Basic Design/Structures or environmental processes. Others choose to remain involved in most or all of the aspects and serve as generalists, although this does not preclude their becoming experts in a specialized area.

People typically advance in their consulting firms to **Project Management** positions on the basis of their leaderships, performance, and overall knowledge of project development. Management responsibilities begin with supervising and coordinating the work of others and progress to the administration of a project to provide the services within Budget and Time restraints. Finally he can reach the level of management and administration at which he is totally responsible for the execution of a particular project. And for some, the management and administrative role develops into the leadership of full fledged **Comprehensive Services** firm.

The choice between generalist and specialist are based on one's own capabilities, goals, and preferences, but either choice can lead to a rewarding and challenging career.

1.4 INTERRELATIONSHIPS OF DISCIPLINES

To understand the total picture of the major disciplines in the arena of Architectural practice,, it is helpful to examine the way they interrelate in the formation of a project.

For many years, the Architect dealt primarily with Basic Building Design, detailing and specifications. There were few mechanical or electrical systems built into such projects. As technology evolved, buildings, factories, utilities, and other facilities incorporated mechanical systems for plumbing, heating, and power, and electrical systems for lighting and energy.

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As each of these technologies became more sophisticated, they commanded greater attention and a greater proportion of the project, in terms of both work and costs. The newer disciplines began to take on full partnerships roles.

A modern office building is a good example of the growth of these new disciplines. Fifty years ago, the cost of the electrical and mechanical systems would have been a minor part of the total cost of the building. Today, however, the mechanical, Air-conditioning, Telecommunication, Computer Facilities Installation, Net-working, Electrical systems etc. frequently account for more than half of the cost. As a result, mechanical and electrical and other allied disciplines have been incorporated into design firms serving the building construction industry.

Architectural firms serving utilities and industries may combine all major disciplines and some specialties to provide complete services. With the modern-day emphasis on pollution control and other environmental concerns, for example, the chemical engineer is becoming more involved in projects other than process industries.

Still, there are many firms that specialize in one discipline only. Perhaps this type of practice is most obvious in the commercial building field, sometimes referred to as 'interprofessional' practice. The architect is usually the prime design professional and subcontracts structural, mechanical, and electrical systems to consulting firms specializing in those disciplines. However, there are now instances where firms are being formed to combine the mechanical and electrical disciplines, which gives the Lead firm a majority of the work and greater control of the project.

Architectural/Consulting engineering firms exist in virtually every conceivable size and organizational structure. They are as varied as the services they provide. Some insight as to the interrelationships of the various disciplines can be gained by examining the types of practice available to the Architect/Consulting engineer and by looking at some examples of how an Architect/Engineer in a firm might relate to professionals in other disciplines in providing comprehensive professional services.

The types of practice can be divided into four general categories 1) the pure consultant, expert, or specialist - one person with a highly developed expertise 2) a single-discipline firm in support of another discipline, or another profession, or under direct contract to the user 3) a multidiscipline firm providing complete services for complex projects involving two, three, four or more disciplines; and 4) the multiprofession firm providing multidiscipline services involving architecture, planning, law, science, environment, economics, and management.

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1.5 PURE CONSULTANT

The pure consultant is a professional who has developed a high degree of expertise in a particular subject. He is sought for specialized problem solving, expert testimony in courts of law, or consultation for high-level decision making. His success is determined by his level of knowledge, ability to communicate, and established credibility. Normally a one-person firm, this consultant is totally dependent on his own abilities and the demand for the expertise that he has to offer. He has a considerable amount of freedom and is not encumbered by payroll and other needs of a larger work force. On the other hand, he does not have the technical and professional support of associates to the help to carry on, should he become temporarily or permanently incapacitated.

The growing complexity of technology and the concurrent growth in litigation have led to a specialty known as "Forensic Expert", which is generally defined as the application of engineering science and theory to accident investigation and courtroom testimony. This type of practice requires an exceptionally high degree of knowledge in specialized areas, such as properties of materials, Specifications, behavioural study of Finished Items of Work, stress and fatigue, failures, electricity, toxic materials, soil mechanics, and all categories of electrical and mechanical systems and equipment.

In as much as the pure consultant is totally dependent on his own expertise and credibility, which can be achieved only with many years of directly related experience, he is normally an alumnus of a larger design firm, an industry, or a university faculty where he had an opportunity to develop his potential. It is not the type of practice that a new graduate would expect to enter directly.

1.6 SINGLE-DISCIPLINE FIRM

The single-discipline firm concentrates the talent of a single discipline and often limits its scope of service to a specialty within a discipline such as basic design and detailing, Local Authority approvals, Model and perceptive making, specification drafting, contract drafting etc. etc. While some firms of this type contract directly with the user of the service, many provide services as subcontractors to other disciplines or to other professions. These firms may provide a full range of services in their discipline, or they may restrict their practice to more specialized services like systems analysis or feasibility studies.

One of the most common single -discipline firms is the Architectural firm that subcontracts to Structural Design firm for the design of the structural systems for a building. The engineer's participation normally includes design and detailing for fabrication and construction of the building structure and, depending on the contractual relationship with the architect, may also include participation in the conceptual design, cost estimating, and observation of construction.

The Architect must work closely with other engineering subcontractors: with the soil specialist or geotechnical engineer regarding foundations, and with the mechanical and electrical engineers to coordinate floor loadings and accommodate space requirements. Although the architect has final responsibility for overall coordination, the engineer must use his own initiative and develop a close communication with the other subcontractors to avoid interferences and other discrepancies.

Some of the other disciplines or specialties frequently practiced in single-discipline firms include Landscape, town Planning, Transportation Planning soil mechanics and geotechnical, traffic, acoustical, electrical, mechanical, mining and transportation engineering etc. etc.

1.7 MULTIDISCIPLINE FIRM

Multidiscipline firms have developed in response to projects requiring integrated multiple disciplines.

While the overall co-ordination of the project is the responsibility of the project Team Leader, it is not possible for all co-ordination and decisions to be handled by one person. Consequently, most of the co-ordination is accomplished by the participating professionals/experts communicating across discipline lines, and only the major coordinating decisions are referred to the Team leader. Such projects require a high degree of teamwork and initiative on the part of each individual with design responsibility. The individual must have a thorough understanding of his own discipline and at least a working knowledge of each of the other disciplines with which he must interface.

1.8 MULTIPROFESSION FIRM

Multiprofession firms are a relatively recent development. They go one step further than the multidiscipline firms and include not only the various disciplines of Architecture and Engineering but also the disciplines of other professions such as planning, law science, or management. The advent of environmental and economic impact studies, Government regulations, grant programs, the space program, and the energy program has engendered a coalition of many professions to address the broad spectrum of concerns. Modern siting of an industrial facility draws upon the expertise of biologists, meteorologists, zoologists, archaeologists, geologists, sociologists, economists, planners, engineers, lawyers, and public relations personnel. Certainly it is not necessary for each firm to employ all of these different experts. Indeed, many experts are retained as individual consultants in the capacity defined as pure consultant. However, the trend has been for large firms to place these multiprofession experts on their payrolls to maintain control, to be sure that the capability is readily available when needed, and to demonstrate the firm's ability to handle specific projects.

1.9 DIVERSITY AND CHALLENGE

No matter what discipline he has selected, the graduating Architect will find that the profession offers diversity and challenges. There is a place for the Architect/Engineer with a high degree of expertise who wants to practice forensic engineering or consult in a highly specialized area. There also is a place for the Architect/Engineer who wants to be a part of a team highly skilled and competent in the practice of a common discipline or a team involving several disciplines and perhaps other technologies and professions as well.

Architectural practice offers opportunities to design new systems and facilities, to analyze existing works and evaluate economic feasibilities, and to administer contracts or manage construction. It is an excellent career choice for the Architect/Engineer who likes working with people to develop concepts, solve problems, improve the environment, enhance the quality of life, conserve and make the most effective use of our resources, and bring together all of the skills and solutions that technology can provide. There are diversity and depth in profession long and short-term assignments, projects of varying size and scope, individual and team effort, and relationships with both staff and clients.

2 PROFESSIONAL SERVICES

The practice of architecture, as well as some forms of engineering, has changed dramatically in the last few years, and more particularly since mid fifties, when due Bombay Rent Control Act of 1948, housing construction by landlords for renting out started becoming unviable. This led to emergence of new pattern of construction by agencies which have come to be known as Builders/Developers etc. Most A/E's have had an education that has been deliberately pointed toward the aspects of the profession that the general public feels are the important ones: design, drafting, some knowledge of construction, and the "drawing of blue-prints". With the increase in trends in total project or 'turn-key' projects there has also been an increase in the possible services that may be included by the A/E. The truth is simple: the A/E must consider the different kinds of services he may provide and what fee he may receive for those services.

Increasingly, the Architect/Engineer is often expected to be more than a designer, is assumed to have considerable knowledge about the purchase of property, feasibility of construction at a particular site, construction costs, and possible financing, leasing and management, and many other phases. This situation has had great effect upon the services offered by A/E offices. Some offices have reorganized or expanded to include the required services, or have simply become agents to assist the owner to procure these services and the coordination necessary. The client who has more than design problems will appreciate an A/E who has business and managerial ability, esthetic value, and is conscious of building costs. These qualities are again forcing the Architect/Engineer to be considered as master builder and to include all factors involved in the entire construction process.

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2.1 *EXPANDING FIRMS*

The requirements for these expanding services in the A/E office have created some major changes since World War I. Prior to that time most A/E offices were primarily design oriented. Since then, the majority of firms doing more than residential work have realized that they must include some or all of the extra services in order to survive or expand. Some firms have added a few people to their staff with expertise in the related fields desired. Some firms have simply added consultants who may be called upon when required. An increasing number have organized complete departments and may even have made arrangements for joint-ventures whenever other knowledge is required. Another trend is the design construct team in which major A/E firms and major contractor firms have joined forces.

2.2. PROFESSIONAL SERVICES

Several years ago the American Institute of Architects found, by a survey, that professional services could be classified into six major groups. This survey also determined that a number of organizations already were operating within the general scope of these six groups and that the profession's existing documents could be readily modified to include the concept of comprehensive services. About the same time that this was happening, there was also a beginning trend for A/E offices to combine with construction firms. Ethical considerations have previously held that architectural firms could not represent both designer and builder and be honest about it, so a more realistic updated approach was necessary.

The survey included the so-called basic services which are essentially those of design and planning as well as the other five services. As a start toward understanding these six groups let us look at them as given in the A.I.A. - Architects Handbook, chapter 20, and as follows :

1. Project Analysis services
2. Promotional services
3. Design and Planning services
4. Construction services
5. Supporting services
6. Related services

This outline does not pose a conflict between basic services and those of comprehensive services. The basic services are those customarily considered design while all of the others are complementary and directly related to the possibilities of the design. The comprehensive services follow the general scheme of a project.

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2.2.1. Project Analysis services

The building public in recent years has asked the A/E more and more to provide services that may not necessarily be design, but that are helpful to the client as well as to the designer. For the most part these are not basic services but are, in addition to those services, related closely to the feasibility of a project, and may be handled as an agent-of-the-owner by the A/E. In many cases the A/E is in a good position to provide these analysis services. In other situations the A/E may be employed to provide these services as a part of project management or simply as a more convenient and intelligent method for consideration by the client.

Feasibility of a small project, and often for larger projects, is very important. Is the facility needed, what are the economic requirements, what is the best location and is it available, what are the legal requirements or obstacles, and is personnel readily available to operate the new facility? In the same vein are considerations for the financial analysis for a project. In order to develop there must be adequate initial money, and in most cases a continuing supply for profitable maintenance. When considering location it is important to investigate initial cost of the land in relation to other locations, amount of land taxes and probable taxes on the new construction, insurance rates, interim financing possibilities during construction, and perhaps long-range financing via mortgages or other means.

With the introduction of various ecology groups or statutes, the site analysis and attendant report is of vital interest and importance. Relationship of the site to transportation, raw materials, markets, and working labor needs to be acceptable and the climate needs to be "right". A survey of legal requirements, or more importantly, legal restrictions, is also vital since smoke, manufacturing fumes and gases, solid or liquid waste, noise, and perhaps traffic congestion may be a determinant for a site. The site and the climatic conditions are important to the design concept so are often included in the basic services rather than as a special or extra condition.

The actual building program and the operational sequence within the project are again closely related to the design so may or may not be considered basic services. The A/E must know the sizes of rooms or spaces, their uses, relationship to each other, and the required or special finishes on all exposed surfaces. These factors are closely related also to personnel who will work in or otherwise use the facility., and such things as quantity of light, toilets, lounge spaces, possible recreational areas, and other "people comforts" are important. In many embryo projects these items are contracted for as a sort of research along with other feasibility studies and are certainly not basic services then.

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2.2.2. Promotional services

Promotion of a project may seem to be a self-serving service of the A/E and in many cases may be the difference between losing a proposed project or doing it. a great deal of this work may be classed as public relations but the A/E is in a position to assist the owner in many ways. This is particularly true when changes of land planning are involved. In these cases the A/E may be called upon to provide environmental surveys, sketches of the proposed structure, and the actual processing of applications for changes to governmental planning departments.

2.2.3. Design and Planning

This area of the A/E's services is generally considered as part of the basic services to the client, and may be divided into two major parts: operational design and the building design. The first of these may fall into place as the A/E talks to the client but in many cases the client may be repeating his customary operation process, which may be faulty and subject to some revision by others outside his business. Here the value of the A/E's ability to organize functions and operations may be of great help.

Building design is first a planning problem, and as this is cleared up becomes a problem in communications. The entire process may be divided into the seven parts recommended by the American Institute of Architects as follows, although some overlap can normally be expected.

1. Schematic design
2. Preliminary estimates
3. Design development
4. Outline specifications
5. Cost analysis
6. Working drawings
7. Final specifications.

The A/E must communicate with owner's representatives, plant engineers, and various equipment or process representatives to amass a considerable amount of information as to how the finished project should properly function. In the case of residential work, this means finding out how the family operates; do they entertain formally or casually, how much entertainment, do family members have any at-home hobbies, age and sex of probable occupants, preference for certain style and of course budget requirements. Having done project analysis studies for commercial or industrial clients will have provided similar information for this phase of the services.

2.2.4. Construction services

Here again we have services that are familiar to the A/E as they have been normally included as a part of basic services. The building public has accepted most of the following list of activities as those that go along with the design, planning, and construction of a project.

1. Bids and construction contracts.
2. Supervision (observance) and administration
3. Job cost accounting
4. Construction management.
5. Postconstruction services.

The general area of construction services may be divided into three major types of operation : 1) full inclusion as a part of basic services, 2) no construction services included, or 3) only construction services included. In the first case the A/E simply continues his participation to provide the documents, field observation, cost accounting, and related work until the project is completed. Special personnel may be employed to take care of this phase, but in many offices the principal, project manager, or other reasonably knowledgeable person takes the responsibility as a normal part of their work. Acting as an agent for the owner, the A/E can suggest methods for arriving at a contract and can be aware of the day-by-day progress of the project from his field trips and paper work required.

2.2.5. Supporting services

Most of the services offered, or possible, under this heading have been available for quite a while and in many cases have been supplied as part of the basic services. The average A/E office, planning the design of a project, must of necessity also take into consideration some supporting services which directly affect the project. for the most part these items consist of planning, such as site plans, landscape work, interiors and furnishings, art work of various types, acoustics, food services, lighting and communications systems, and perhaps even roads for larger types of construction. Special supporting services are usually concerned with economics marketing of products, or the merchandising of the finished product. These latter items fall considerably outside the general range of the average A/E, and thus require very special researching.

It is almost impossible to try to plan a project without including all phases of the engineering required, including plumbing, air conditioning, acoustics, as well as the structural engineering involved. Normal practice in an architectural office most often handles these items by engaging the services of a specialized consultant. somewhat the same situation exists in regard to land planning and landscape work. Extensive design of roads or parking is usually done by a civil engineering consultant.

The interesting aspect of present A/E services, however, is the fact that more and more A/E offices, large or small, are now finding that since the public expects them to be experts in these subjects, they, the A/E office personnel, are now either specialized or are generalists with varied but related technical skills in these new areas. These new skills are learned from in-service education by the professional societies or through extension courses given by college and universities.

2.2.6 Project Management Services

Project Management is a relatively new thing with A/E offices. Total Project Management is basically the handling of the entire Project, often from purchase of Land to completion of construction. There are many specialities involved and at present most of these are provided by separate consultantsd or other firms employed to provide these srvices. The operation of this business by A/E calls for considerable change in their perceptions. Very few A/E's at present are really qualified to take on a Project Management assignments.

Project Management can provide an opportunity for offices, both large and small, new or well established. Essentially, the service is a type of "Turn key" operation in which an organization contracts with a client to provide total or partial service as required. The total contract involves selection of A/E services, construction contractor selection, and in some cases also includes acquisation of real eatate, leasing of building space, and other related work.

The A/E is in a particularly favourable position to engage in Project Management. By education and experience, plus a reasonable amount of business management, and ofcourse the desire to engage in management, the A/E could very well participate in this new field. While the Architect/Engineer may not be very expert in the field of real estate, Law, Insurance, Marketting etc., associates can be taken in to help the A/E in such Total Project Management.

2.2.7. Related services

The A.I.A. research study indicated the following items as related and certainly there would be little rebuttal for that statement.

1. Educational consultation
2. Industrial consultation
3. Research and testing
4. Products design
5. Architectural graphics
6. Prefabrication processes.

These are for the most part related but there may be considerable difference of opinion about A/E offices being actually interested or capable of being considered expert enough to render a service in the areas listed. For Practicing Architects and Engineers, venturing into these related services objectives, an extensive knowledge of manufacturing processes, metals, plastics, machinery, and related subjects is necessary to advise correctly in regard to these items and very few A/E firms have that knowledge.

The design of architectural graphics may be a service of an A/E office but again only a few offices may have personnel sufficiently aware of four-color printing, photo reproduction, or other processes used in much of architectural graphics.

3 THE CONSTRUCTION INDUSTRY

The construction industry is tending to become one of the largest industries. Its growth is due to a constant demand for more buildings, new buildings, remodeling, all economically designed and esthetically pleasing, as well as functional to the occupants. To provide these projects require not only vast numbers of workers in many different fields, but also clients. Construction must keep pace with the economy and the projects must be designed to fit within the budgets of the clients.

In order to understand the relationship of the varied and numerous identities involved in almost every construction project we must first consider them separately. The construction field covers many areas and may be roughly divided into building construction and engineering construction. Generally the architect is involved only in building projects while the engineer, usually a civil engineer, is most often involved in the designing of roads, dams, and similar engineering projects. The processes in either case are comparable and both share the same objectives-to provide quality construction in adequate quantity at economical costs.

3.1. GENERAL ELEMENTS

Whether the construction project is a building, building complex, engineering project, or a combination of both, the elements required fall into five or six major groups. The general groups of interest to us are :

1. The Owner : public or private clients
2. The design Professions : architects, engineers, and related technical personnel.
3. The construction Forces : general contractors, subcontractors, material suppliers, building trade unions.
4. Manufacturing Industry: material manufacturers, fabricators, distributors of all sorts.
5. Control Authorities : building departments, fire marshals, code writing groups, environmental control organizations.
6. Related Elements : financial organizations, insurance companies real estate services.

Each of these groups will normally be included in some manner in any construction project. It would be quite difficult to visualize any project, except perhaps one in which the owner is also the designer, constructor, finance source, and possibly real estate owner, that does not require the cooperation and coordination of most of the above professions. This last statement, however, may not be true for a much longer period since a considerable number of developer organization are coming into being. These organizations handle all phases of a project, including those noted above and in addition such related activities as sales, maintenance, and management. We are also seeing more groups being formed simply to manage projects. Their services provide for the handling of all phases, for a fee, although the management group or individual may not be registered, licensed, or otherwise documented in any manner.

3.2 DESIGN PROFESSIONS

Architects and engineers form the basis for the design professions, assisted by helper personnel of varied experience and skills. The architect functions as the coordinator of the building process; he designs the structure, is responsible for the drawings and specifications, employs the consulting engineers or others who work as consultants, is the general administrator of the construction, and provides opportunities for assistance with many related problems that may arise.

The combination of architect and his own office personnel, plus the engineer-consultant and his office force, plus any special consultants, usually forms the design team. With this combination, the architect provides the expertise to plan the project and to develop the construction documents (working drawings and specifications), the structural engineer calculates the structural requirements, the mechanical engineer designs the plumbing, air conditioning, and ventilation systems, and the electrical engineer supplies the information for electrical and sound requirements. With many offices, the specifications are also "farmed out" to a consultant. as are unusual requirements for food service, material handling, acoustics, and perhaps other specialized needs. As the architect is most often the prime mover in this process, with a direct contract with the client, he is also responsible for the quality of all work issued from his office, including all work done by those who act as consultants to him.

Engineers may be thought of as belonging to two groups: those employed as consultants to architects for structural, mechanical, or electrical work; and those operating their own offices for design of work that might generally be considered civil engineering. Either group operates an office in a manner similar to that of the architect, however the architect is the client of the consulting engineer, while almost any of the owner-types indicated earlier may be the clients of the nonconsultant. Some engineers may be employees or partners in a design firm. In most states the engineer must be registered in a similar manner as the architect and may be somewhat specialized as a civil, structural, mechanical, electrical, or other type of engineer.

Obviously the architect or engineer cannot normally produce all of the required documents by himself, so he is assisted by other technical personnel. Designers, draftsman, estimators, specifications writers, and project coordinators may be college trained or have long experience. They each have a specialty to contribute to the entire operation. Others who may work with, or for, the architect are urban planners, estimators, landscape architects, decorators, or artists. Some may be registered as architects or engineers but this is not a requirement.

3.3 THE CONSTRUCTION FORCES

The construction forces of all sorts thread through the construction field in a manner similar to the bloodstream in a living being. The major arteries are the general contractors, supplied by many subcontractors, who in turn are supplied by a myriad of material suppliers. In every phase there are hundreds and thousands of individual trade-craft mechanics, salesmen and representatives. The entire process requires utmost coordination. The general contractor usually has the prime contract but occasionally some subcontractor, mechanical or electrical perhaps, with a large portion of the project work, may be termed the prime contractor. A prime contract is one of agreement between the owner and any contractor. In normal construction procedures, the numerous subcontractors are not prime contractors since they usually have a contract with a general contractor, who has the prime contract with the owner.

Many states in USA have requirements for licensing of contractors. However for some reasons or the others, efforts of PEATA since last over 15 years has not met with success to create awareness and need to be recognized by local authority in Mumbai. i.e. erstwhile Municipal Corporation of Greater Bombay, to institute licensing of Contractors/Builders. Where licensing is required, the classes of contractors may be divided engineering, general building, or specialty contractors. The first are licensing to do civil engineering work, roads, dams, irrigation systems, and the like, while the latter are licensed to construct almost any type of building project. The specialty contractor is one with specific expertise in a limited field such as a plumber, painter, electrician, and others who normally work as "subs" for a prime contractor.

4 OFFICE ORGANIZATION

Completion of registration as an architect seems to inspire the new architect into considering a practice of his own. In many cases he may have been employed by a firm for several years and, while having been periodically promoted, may not be entirely satisfied with the prospects of his future. He may have been offered a commission to do a project on a 'moonlighting' basis or the office in which he works may have passed along a small project which they could not handle for some reason. probably everyone dreams of someday being "the boss" and young architects are no exception. In addition, the actual cash or equipment required to start an office for the practice of architecture or engineering is quite minimal.

4.1 SINGLE PROPRIETOR

The individual owner or single proprietorship type of operation is still alive and doing well in many cases. The primary advantage, of course, is that the proprietor is his own boss and can accept or reject any clients as he feels inclined. This may be good or bad. If there are enough clients with the right kind of projects, the new firm should not have much trouble. However, if the proprietor is a little particular about the type of work he does, and there isn't enough of that available, the going may be a bit more difficult. There is considerable satisfaction in doing only the interesting and challenging projects, but many young offices find that some compromise is usually necessary.

The disadvantages seem to outweigh the advantages. While the architect may be a good designer and like to do this part of the total work, someone must be out finding more work to keep the office alive, and someone has to keep following up the obtaining of required approvals of proposals from various departments of Approving Public Authorities. at local, state and national level. The same is, of course, true of all other phases of the project. Finances to operate the office are available through only one source-the owner. When the architects is out of the office, too often the office is closed, with the possibility of missing important telephone calls, manufacturers' representatives, or prospective clients.

A small office usually does small work-perhaps better in quality, but nonetheless small in size or dollar value. if draftsmen are employed, there is always the problem of keeping them busy if projects are not available, and the additional lack of ability to do all phases of the project may cause some problems. Smaller offices seem to employ less experienced draftsman may not be as thoroughly trained or able to make decisions without approval from the "boss". and certainly, if any trouble arises on a project or a court decision is given against the office, the single proprietor is the one who assumes the entire load-perhaps to bankruptcy.

For those who like to have the entire responsibility, and can handle the financial and other aspects that go with it, single proprietorship is certainly rewarding. There is a pride in being able to feel that you, and you alone, operate a successful business doing quality work. There is also a responsibility to any employees to keep them happily employed and of course to the architect's family. This latter can be a major problem since many more hours, nights, and weekends will be used in finding work and processing it properly. Until a single-proprietor office really develops, there is usually a minimal chance that multi-million projects will be offered, due strictly to office size, but as the office continues to grow this deterrent may be gradually eliminated.

4.2 THE PARTNERSHIP

This form of office organization may be considered in two major styles: two or more equal and active partners, or a senior and a junior partner. Each condition may also involve associates. Partnerships exist where all partners are registered architects, where partners are architects or engineers, or even where only one person is a registered architect but other partners are contractors, lawyers, or good businessmen in related fields. Which is best depend greatly upon the qualifications, financial status, capabilities, and interest of those concerned.

The most obvious advantage of a partnership is the fact that more than one practitioner means more cash-backing, more actual hands or bodies to do the work, more minds to think out the problems, and more client contacts that may be made. In a well-developed partnership, the various phases of the work are as equally divided as is possible, each responsible for the portion delegated to him.

4.3 *THE ASSOCIATES*

The term associates may mean something or relatively nothing. When younger employees reach an advanced stage of value to the office, they may consider their own office. they may have skills difficult to replace and not really want to leave. They may simply want some recognition. Enter the associate status. Name on the door and letterhead, with no change in financial situation, or office responsibility may be the answer. If this arrangement continues as additional raise in pay or a part of the profits any result. In larger firms there may be quite as many associates as numbers of partners. Associate firm members expect to ultimately become partners and usually do, or they use that status symbol to negotiate for a better situation elsewhere.

4.4. *THE CORPORATION*

In many states a corporation may be formed by architects. simply explained, the corporation is a theoretical employer organization and all members (stockholders) are employees with financial responsibility limited by the amount of their investment. When a partnership becomes so large or unwieldy that efficient operation becomes difficult, the partners may decide that a corporation-type office, with its benefits, would be very interesting. a corporation is formed by obtaining approval of articles of incorporation, or a charter from the state, establishing a board of directors, and electing a slate of controlling officers. A stock issue is provided and may be common stock or preferred stock, the latter having priority or preference when dividends are declared. Stock may have an initial par value or no value and the investors either buy shares, or acquire them by their monetary interest in the office. This cash inflow provides the starting finances for the corporation. The board of directors and elected officers are responsible for the efficient operation of the corporation and all persons work for the corporation as employees and receive a salary, plus stock dividends, plus a bonus, if profits are more than those expected. Market value of stock fluctuates up or down from issue price depending upon amount of dividends or other indications of profitable operation and may or may not be indicated in stock market quotations.

4.5 JOINT-VENTURES AND OTHERS

The developer has appeared on the construction scene in the past few years. This is usually a corporation-type organization or a conglomerate of several corporations. Unlike the architectural office or that of the consulting engineer, the developer office includes real estate purchase (and possible resale of raw land), development of plans, construction of buildings, roads, and other facilities, sales, and perhaps management. Any one of these activities could "go sour", even with the most expert advice, so participants need to protect themselves as well as the interlocked activities.

When we consider formation of an architectural office we normally consider only registered architects. There are many other combinations that may be considered, however. Present day development and construction practices indicate that serious consideration should be given to association in one form or another with contractors, land developers, or others in near-related fields. The old taboo on architects also operating as contractors for the same client has been removed elsewhere to the world. Assistance in profitable development of vacant land or urban reconstruction is also a possibility. Project management in cooperation with other businessmen is an area of increasing interest. Most state laws relating to use of the title "architect", in any of these associations require that a clear indication be made as to exactly who is the architect. Where architect-engineer combinations are arranged, each professional must usually sign or take responsibility for the entire project. Each type of arrangement should be carefully investigated before starting a new office and the one which seems to present the most advantages and fewest disadvantages considered.

4.6 CONSORTIUMS - LOOSE AND JOINT

In the last several years the nation's problems with need for housing development, energy and natural resources, waste management, water treatment, transportation of people and goods, and facilities for national defence have grown formidably. This growth has spawned a corresponding need for large-scale projects to handle these problems. Local, state, and Central government agencies and private industry are conceving and calling for construction of such large projects that single firms and even small groups of professional firms cannot accomplish them in the desired time. This has brought about what is called a consortium. It generally consists of several firms, including all of the required disciplines, the people to staff the project, and the necessary financial resources. A consortium for a single project would be a large joint venture; if for more than one project, it would be a partnership.

The administration and operation of these consortia throughout the project, which may take many years to complete, become very complex. If not planned and executed properly from the beginning, they can become a maze of paperwork, meetings, and organizational delays. Experienced and knowledgeable administrators, as well as experienced and capable proffessional, are essential to keep these large groups operating efficiently. Examples of projects calling for such large groupings of professionals would be major city rapid-transit systems, large nuclear power developments, major defense installations, space research programms, and Mega Mass Housing Porjects.

5 SUMMARY

In the foregoing contents, we have had a general look at, and review of, the various trends that are evolving and opportunities that are emerging, in professional practice of Architects/Engineers.

5.1 THE PROFESSIONAL

The concerned professional will better be informed and tuned to adopt various situations at each stage of his advancement of professional practice and expertise gained. Unless he keeps abreast of developments and keep preparing himself to various adaptations, he will tend to reach a ceiling at a lower end of fast developing trends and situations.

5.2 THE COUNCIL & ASSOCIATED INSTITUTIONS

It is time, the regulating bodies like Council of Architecture and self disciplining bodies like Institutes, take cognisance of the emerging trends and adopt identity of these situation in their regulations or codes of conduct. Else, the Architect, conceived only as basic design professional, will have to limit himself to, though a very important one, but a microscopic function, in a canvas of vast macros that are emerging in fast developing situations.

Many taboos, currently existing and applied, towards functions of an Architect only as basic design professional, have slowly and gradually, but definitely removed world over.

It is time, cognisance is taken of these trends and opportunities to remove the constraints wherever they exist in current code of Conduct/Ethics.

5.3 THE PUBLIC AUTHORITIES

The Public Authorities, controlling and regulating all developments including the professional practices need to take due cognisance of the changing scenario and adopt their regulations, as the role of Architects/Engineer takes on a wide macro base and operations.

5.4 THE PUBLIC, CLIENT & CONSUMER

These set of individuals and groups, will need to accept the developing trends and resulting situations, from their present understanding of the professional as only basic designer.

ARCHITECT/ENGINEER - MUTUAL INTEGRATION

Given the scenario, as not only a probable but a definite one, which has already partly arrived in our environment of professional practice in India, it is time the need for mutual integration amongst two major and principal players, i.e. Architect & Consulting Engineer, is well taken, understood and implemented.

For, due to size of projects to come up in future, including their complexities, as also the comprehensives of services which will be the rule of the day to come, this need for interaction and cohesiveness be better understood, adopted and practiced.

20TH CENTURY CROSS FERTILIZATION - Integration of Architecture with (Structural) Engineering

The first decades of the 20th Century saw an intellectual cross-fertilization between architects and civil engineers. during this period the profession of Civil Engineering gained a respect that it had not had since the 18th Century. The architectural theoretician Henri van de Velde (10) wrote in 1903:

" There is a group of people from whom we can no longer withhold the title of Artist. Their work is supported on one hand by the utilization of materials that even supersedes that of the builders of the great (Gothic) Cathedrals.
These artists, the authors or creators of the new architecture, are the engineers."

Representative of those many authors who wrote about the "Engineers Aesthetic: in the 1920's is **Le Corbusier**. He wrote in **Vers Une Architecture** :

> "The Engineers 'Aesthetic and Architecture - two things that march together and follow one from the other - the one at its full height, the other in an unhappy state of regression."
>
> "....The Engineer, inspired by the laws of Economy and governed by mathematical calculation, puts us in accord with universal law. He achieves harmony....."
>
> "...The Engineer, who proceeds by knowledge shows the way and holds the truth..."

The Engineer of today make use of the primary elements and, by coordinating them in accordance with the rules, provoke in us architectural emotions and thus make the work of man ring true in unison with universal order.

At the end of the book, **Le Corbusier** places the relationship between the engineer and the architect into perspective. **The Architect is above all an engineer.**

PERCEPTIONS & POSSIBILITIES IN 21ST CENTURY

As seen from the contents of foregoing paras and taking a broad perspective of projections, vis-a-vis the imerging trends, the inputs expected of the profession of an Architect/Engineer, will be for beyond the limited perception of Architectural & Professional Engineering Practice, as is practiced and understood hitherto.

The projects to be looked to, will encompass Mega-Mass Housing Projects, Mega Infrastructure and Transport Development Projects, Mega Township Projects (not typical "Nagars" and "complexes" hither to known to Builders/Developers,) etc. etc.

Such Projects will certainly and definitely call for professional inputs by formation of corporations, Joint Ventures, Consortium etc.

The Professionals, the Controlling & Regulating Authorities, the Public, the Consumer, the Clients etc. will have to a take a new look at the changes as they evolve in the present scenario and adopt their perception of possible inter-relationships, duties, Responsibilities, Liabilities etc. as these changes in role and perception of professionals develop.

Thus the 21st Century operation, in quite a few situations, may make, the perception of 20th Century, a distant past, calling for an entirely new look and adoptations, as they emerge.

SESSION II

PROFESSION, PUBLIC, CLIENTS AND COMPONENT AGENCIES OF BUILDING INDUSTRY

PANELISTS

SHRI P. M. KALE (Ex. Director E. S. & P. of Municipal Corporation of Greater Mumbai)

SHRI M. Y. SABNIS (Ex. Chief Engineer (D.P.)

SHRI R. K. DEOLE

SHRI L. D. BABLADI

TECHNICAL SESSION II

EVALUATION OF EXISTING SYSTEM

1.00 INTRODUCTION :

Entire gamut of Building constructions and development till 1950 has been based on different social and economical context particularly in urban Areas. Majority of Buildings either residential, commercial or industrial were put up and considered as permanent investment and the owner being final occupant beneficiary and only person responsible for maintenance. He was naturally interested in adequate quality in the proposed constructions. Due to this standard practice evolved envisaged the constructions being done through expert contractors and architect acting with total overall control, through acceptance supervision and certifications of payment to contractors. For day to day supervision clerk of works having adequate qualification and experience was appointed under architect's control, paid by owner, to continuously supervise the work of and to control erstwhile reputed contracting agency which invariable used to be there.

During last half century, the inflationary trend has set in. Rate of interest in fixed deposits either with banks or with corporate bodies have increased in leaps and bounds. Consumerate increase in interest is not evident in properties and real estate as permanent investment. Due to Rent control Act, Buildings for Renting has stopped. The class of developer known as "Builders" has therefore emerged and building constructions are being undertaken as a business for the sale of tenements on ownership basis. Builders having temporary interest in the property have restored to methods hitherto not followed in order to increase and accelerate their profit. Under such economical social pressure the systems envisaged earlier is not working properly and satisfactorily dye to several legislative and other lacunae.

Rapid urbanisation and industrialisation coupled with heavy demands has lead to slow & steady but definite detoriation in the quality of building materials supplied in market. Building material market most of the time remains sellers market and deterioration in quality of supplied materials has contributed substantially towards deterioration in quality of construction. Gradations Certifications, and warranty of input supplied for construction has assumed form of essential requirement, which has not been given, any attention by powers and authorities that be to an extent warranted. Site checking and testing with sampling has its limitations. Many times nightmarish situation arise due to such defective material supply is especially in case of cement and steel.

In this session have to deal with evaluation of existing systems and evolve statutory provision for different component agencies connected with development and building construction. There should be an attempt to specify and compile essential functions and building operation by different component agencies. A function from one agency might be shifted to other agencies but abandonment of any function of any agency is fraught with hazardous consequences.

The profession of Architecture calls for men of integrity, business capacity and technical and artistic ability. The Architect is enthrusted with financial undertakings in which his honesty of purpose must be above suspicion, he acts as a professional adviser to his client and his advice must be absolutely objective, he is charged with the exercise of judicial functions as between client and contract and must act with entire impartiality. He has moral responsibilities to his profession, associates and subordinates and finally to ultimate users.

What is really essential in this scenario is making all components aware about need to improve the construction, give them methodology and tools so as to enable them to achieve good construction. A practical down to earth manual the project in need of the work. Unfortunately the academic training in Engineering or Architecture does not give expertise to enable them to achieve full quality control, coordination and management on day to day basis to enable them to give output in the form of sound workmanship like building of good quality. There is need for interaction between the industry by which the experts with proven track record involve themselves in the teaching process directly and also through faculty to ensure that the graduating student can atleast be called as an Architect or Engineer as the case may be.

2.00 TRADITIONAL ROLE OF ARCHITECT

2.10 Traditionally the architect has been considered as a principal technical agent of the client, who now to be a clever synthesizer, leading an integrated infrastructure of various agencies connected in the project to arrive at a successful product in Architecture. The technical services essential for the project which were beyond the architect's scope were assigned to other consultants and specialised agencies to be selected by the architect in consultation with his client. The scope of reference and responsibilities of such professionals were part of overall professional responsibility of architect. Architect naturally headed team of consultants and acted as a principal co-ordinator and decision maker for and on behalf of his client. The roles of the architect and other consultants were defined by the respective agreements with the client.

2.20 Skilled Contractor :

The work of any construction or building development was contemplated to be executed through the agency of skilled experienced and reputed contractors having requisite expertise and capacity to execute the respective class works satisfactorily.

2.30 Architect's Powers and Controls :

By virtue of standard conditions of the contract between the contractor and the owner, the architect had wide powers and authority to accept or reject any part of the work based on his assessment and such decision of Architect were final, conclusive and binding on both the parties. All payments to the contractors could only be made on certification by the Architect. With this scene in the background the Architect was a supreme technical authority in every aspect of construction.

2.40 Clerk of Works :

The practice also envisaged appointment of full time competent technical supervisor to be selected by the Architect, to act under his overall authority in all technical matters relating to execution of work, with due adherence to specifications, designs and instructions of the architect. The technical supervisor also exercised day to day control at the site to ensure sound construction practices, quality or materials and workmanship. The remuneration of the supervisor is appointed and popularly termed as "Clerk of works" were borne by the client.

2.50 Clients interest in the Works to be of Best Quality :

The control of the Architect on the project was undisputed and effective on account of powers vested in Architect by the client in the system as above, in which the client who undertook the construction work, had sincere and bonafide interest being the ultimate owner himself. As such he also had to own the liabilities of costs and consequences for early or heavy repairs and maintenance of replacement expenses. The client in this situation was required to make and retain his investment in the project. To safeguard his investment he chose all his agencies which included architect, structural engineer, various contractors, material suppliers - if he undertook to supply any or all materials and site supervisor with due concern for satisfactory execution of entire project.

3.00 Effectiveness of present practice:

3.10 General Working:

This system is still working satisfactorily where the development is done for an enlightened client who is going to be the ultimate owner and/or ultimate user, or the project in which the client has PERMANENT INVESTMENT. The instances of such projects are Factories, Banks, Own-Buildings of large Commercial Houses, Bungalows etc. The system works satisfactorily in such cases, both in private and public sector.

3.20 Practice in Government/Public Bodies & Departments:

All government departments, public bodies, state and central corporation who have distinct architectural departments for planning and design, also have all/department for day to day supervision. The agency supervising the work is authorised and empowered to accept or reject any part of the work and to certify all the bills for payment accordingly. These powers are not vested in the unit responsible for planning and designing. During execution of the works the role of architectural department is limited to ensure that the work is being executed as per concepts and details of the design. Such supervisory department is considered essential by all public authorities inspite of the fact that the works are entrusted to selected contractors chosen out of specified category of registration which is in turn based on the contractors technical, financial and organisational resources. The principal on which the architectural practice is based are found thus embodied in working of public bodies too.

3.30 Role of Private Architect in Public Bodies :

Many a times are the public authorities assign certain works to private architect to augment the work of their own departments in general or at the time of heavy pressure. This practice has been adopted by M.C.G.B., B.E.S.T. Undertaking B.M.R.D.A., to name a few. All these illustrious authorities require architects services for planning and designing only, limiting their "supervision" to the clarification in case of doubt only. This illustrious public have their own supervising departments which undertake day to day supervision, checking and certification of all bills etc. This would be evident from copies of model/standard agreements executed by these organisations with the architects appointed by them. Even in public sector wherever owning agency is user the good quality results as in cases of Banks, B.E.S.T., B.M.R.D.A., etc. But in some bodies the commitment to the cause is found lacking particularly where building are for use by other and very bad quality results.

4.00 Changing scene of construction :

4.10 Evolution of new class of developers :

In majority of private constructions, this scene has got materially changed in last over two decades by advent of new mode of construction/development of property popularly known as "Ownership Basis", witnessing emergence of new class of developer who call themselves "Builders". This mode of construction is entirely different as far as relations between various agencies and that with the finished construction is concerned as detailed hereinafter.

4.20 Developer not ultimate Owner :

The developer is not to remain ultimate owner in this system of constructions. The building is planned and built for prospective buyers who come on the scene much later and come to know the full state of affairs, only sometimes after the project is completed and premises are occupied by them. The ownership agreement is generally a on sided agreement and builders allow buyers to occupy the tenements only after full discharge in respect of the Builder's obligations is issued by the purchasers. The problems of maintenance of builders allow buyers to occupy the tenements only after a one sided agreement and building including costs and consequences thereof become the responsibility of the purchasers and not that of builders. While a small class of builders not only maintain good quality but also try to improve the same constantly. The rest are mostly apathetic while some deliberately build bad quality buildings to maximise their costs. Even in this scenario some good buildings do get constructed wherever the owner is committed to do good work and chooses his team accordingly with a mandate for excellent out put. Such thing also happen where the Architect has such a committment and accepts the job on the condition of best construction and organizes who at any cost want to do want to do only good work, even if it means less profit on even a loss.

4.30 Turnover of Capital :

The developer in this system invests his capital only temporarily and that too initially. His natural tendency is to recover his investment as early as possible and roll his capital alongwith profits in further projects. The most successful developer in this system is the one who rolls his investment fast. The quality of construction has no effect on sales as the same is known mostly after few years. The locational and prestigious aspects (like high-rise) of the building have impact on sales. While gimmicks like providing marble/granite flooring, Swimming pool/Health clubs, bus services for remote areas are used to attract buyers, basic sound quality is not catered to at construction.

4.40 Choice of Contractors :

Most of the builders construct the buildings departmentally by employing direct labour or in few cases by appointing a "Labour Contractor". The main criteria for award of labour contract is the lumpsum of overall labour rate and not the quality of workmanship nor adherence to practices of good construction. The speed is the only other factor taken into account which is encouraged even at the cost of sound construction practices, as faster work ensures quick turnover. The agreement with the labour contractor is never through the Architect and often only verbal. The Architect derives no role, let alone powers/authority to exercise control on this agency. The acceptance or rejection of the work of labour contractor is controlled and handled by the developer him self. All the materials required for the construction are also purchased by the developer as per his own choice.

4.50 Role of Developer :

The developer is thus the sole and final acceptor of the entire construction including the quality of building materials, workmanship and the methodology applied. In absence of any main contractor he himself becomes the main contractor. Thus, he assumes "Turn-Key" role.

4.60 Qualifications for Developer :

Many of the builders are non-technical and inexperienced in construction. They also do not generally employ any qualified and competent personnel to look after the day to day progress of work. The sole contribution of most of developers and construction is reduced to merely co-ordinating work involved in supply of materials to various labour contractors and payment of their bills. While they principally attend site for organising sales, they also attend to construction as above.

4.70 Scope of Services of Architect and Engineer :

The developers in this category choose their Architects and consulting structural engineers for limited services of preparation of plans and designs to their satisfaction from sales point of view and assisting them in completing formalities of local authorities. Even in this respect the

established builders directly approach various authorities, M.C.G.B., U.L.C., U.D.P.H. to mention a few. While engaging this professional this scope is made abundantly clear and unfortunately Architects and structural engineers accept such assignments becoming a subservient apent of developer in place of dominant role of architect with full technical control on all agents including the employer. 5.20

4.80 **Authority of Architect/Engineer in such construction :**

The Architect and consulting structural engineers therefore hardly have any authority in the respect of quality control of construction, the employer himself being the contractor. Obviously the Architect or consulting structural engineer cannot be expected to have any responsibility in the matter of quality of construction, materials nd methodology applied. It is common principle of administration and management that the responsibility and authority could go only together. There is also no stature which vests such powers in architect. It is not expected of builders that they would themselves vary the terms of references to the Architects or consulting structural engineer and delegate them the powers to control the developers themselves, in a situation where the developer assumes the role of contractor. It is for the authorities to intervene in the matter to remedy such situation in overall public interest by enacting suitable statute. 6.00

5.00 **Peata's Efforts :**

Peata was first to identify the problem and realising this need. PEATA has been advocating several reforms in this situation, firstly in the form of licencing the builders to make them statutorily responsible for their own deeds and secondly in the form prescribing the requirement of constant day supervision agency by mandatory provisions. PEATA had several meetings with Municipal Authorities. These efforts culminated in preparation of a final and detailed document which was submitted to Director (E.S.&.P) on 17th June, 1985. (Annexure-I) 7.00

5.10 **Need for Change in System :**

It will thus be seen that PEATA has been conscious for the falling standards and deteriorating practices in construction activities on account of failure of earlier deteriorating practices in construction activities on account of failure of earlier system in the changed circumstances as detailed above. The first document in the this regard was submitted as early system in the changed circumstances as detailed above. The first document in this regard was submitted as early 1983 for consideration of MCGB being the local public authority in change of public health and safety. We expected prompt and purposeful action by this illustrious authority but it is indeed sad that no action whatsoever seems to have been taken so far. This issue has also been repeatedly pressed at several forums of seminars in may of which various officers of the MCGB were present. 8.00

5.20 Response form Authorities :

Our repeated meeting, submissions of various documents culminated in a seminar on "Lessons from failure of structures". One of the participants in this seminars was none other than Mr. J. R. Patwardhan Director (E.S.&.P.) who is the highest technical authority of MCGB, which is the body dealing with the subject of development construction in Bombay. It was heartening to note that the views expressed by Mr.Patwardhan in this paper indicated the real state of affairs and were on the same lines as advocated by PEATA. (ANNEXURE-II)

6.00 Failure of Structure :

In this background a "structural failure" was noticed we expected authorities to act expeditiously in cognisance thereof and consider our recommendation to evolve a system wherein the lacunae in current system are filled. The structural failure does not only mean collapse of structure or distress in structural members but also includes leakages, non structural cracks, peeling of plaster or any aspect affecting functional use, to acceptable standards throughout the lifetime of structure with proper maintenance.

Having become aware of this problem PEATA has taken initiative in the matter and has been persistently trying to plead and persuade the authorities to take some remedial action. Unfortunately, none of the suggestions of PEATA have been acted upon so far. It is therefore earnestly submitted that necessary statutory provisions should be made under existing legislation such as BMC Act or by enacting new statute to ensure proper control on construction in Bombay to start with.

7.00 Need for Change :

It is thus obvious that the controls envisaged in earlier system have ceased to operate in changed situation. It is absolutely necessary to redefine the role of each of essential technical component agencies along with their functions, responsibilities and liabilities, restoring original unchallenged technical control of architect on all agencies including employer.

8.00 Objectives for Change :

The proposed Code is evolved basically with an intention to provide fair deal to the owners, occupiers flat purchasers and other constituents of society who do not have any authority or say in the matter of building construction and have been at times victims in the hands of unscrupulous persons as stated earlier. The code apart from fulfilling this social objective would also help all constituent agencies in the industry, making them aware of their true role, responsibilities and liabilities. The code would not only go long way to promote and establish honest and healthy standards amongst various professional constituents but would also make occupiers aware of their rights and responsibilities which is a best thing to happen.

9.00 Impediments through Local Statutory Authorities :

Local statutory authorities are created by various laws to control the development within their jurisdiction. The powers are vested in authorities primarily for the purpose of public health & safety. The general exercise of their powers by evolving redundant, incomprehensible, arbitrary rules, regulations, byelaws, circulars, policies and procedures which lack purpose or direction safely created for arrogation of further powers, have degenerated into very long cumbersome and tedious administrative procedures and requirements in total, disregard to the original aspect of public health and safety. Departmental rivalries, obstinacy, general attitude of passing the responsibility to other departments of others in the department and irrational, arbitary exercise of the power has given rise to meaningless delays, providing ripe ground for breeding of unhealthy trends. This has resulted in almost all agencies particularly the architect to devote most of their time to the offices of local authorities thereby paying minimal attention to their primary technical functions. In reality the unending complicated procedures evolved by local authorities have in themselves become greatest hazards towards health towards health and safety as far as construction industry is concerned.

Hence, the need of present hour is to simplify procedures and expedite the approvals by cutting out all delays and automatic approval by means of a single window operation in general public interest. The statutory authorities are charging scrutiny fee without fulfilling the functions in respect of health and safety relating to private construction.

In order to enable the professionals to attend to their primary functions in respect of building construction activity it is necessary that they are freed from their present full time occupation of chasing files for approval and other clearances. Health and safety being the prime responsibilities to the exclusion of other ones, it is hoped that the local authorities would contribute towards this end by simplifying their procedures. We have full faith that they would do so in the common interest.

ROLE OF COMPONENT AGENCIES-SUGGESTED CODE

10.00 Preamble :

with the progress of science and technology the requirements connected with building activities are becoming complex as well as specialised. The construction activity being necessarily a team work of different disciplines. It is essential and expedient to identify various components involved and define their respective spheres of activity interdependence and functions alongwith their respective rights responsibilities and liabilities.

10.10 Definitions :

in this code unless the contest otherwise requires:

i. 'Person' means and includes persons, Association of persons, firm, company or body constituted or recognised under any of the law.

ii. 'Architect' shall mean and include other professional engaged in the construction activity wherever context so requires, as far as it concerns their field of specialisation.

iii. 'Developer' includes owner undertaking development of his property.

iv. Singular shall include plural and vice versa.

v. Masculine gender shall mean and include feminine gender.

10.20 The provisions in this code shall have effect notwithstanding anything inconsistent therewith in any other custom, usage, practice, code, rules, regulations and law for the time being in force unless provided otherwise.

10.30 Essential Component Agencies :

The following are the essential component agencies for successful execution and completion of a building construction project.

A. Developer

B. Architect/Engineer

C. Consulting Structural Engineer

D. Consultant

E. Site Supervisor

F. Contractor

G. Occupier

10.40 Disruption and Role :

A. Developer

Developer is a person who undertakes the development of a land property in his capacity either as owner of the property or by acquiring development rights by means of purchase, lease, license or power of Attorney. Developer undertaking construction, development for sale as a business shall be a person duly licensed by Statutory Authority to carry on such business.

B. Architect/engineer:

Hereinafter referred to as Architect is a person having requisite qualification and duly authorised by any law government such profession including registration issued by Council of Architecture or any other license or registration issued by competent Statutory local Authority, authorising such persons to undertake the professional assignment involved in planning, designing and acceptance supervision of construction work.

C. Consulting Structural Engineer :

Is a person having requisite qualification to design structural components of construction projects which is duly recognised or registered by the competent Statutory Authority/Institutions to undertake such professional assignment.

D. Consultants :

Is a person having specialised knowledge and requisite qualification of planning, designing and supervising specialised aspects of constructions such as Civil engineering constructions, Electrical installation work, plumbing and sanitary installation, air-conditioning installation and mechanical installation works etc.

E. Site Supervisor :

Is a person having requisite qualifications and experience having a license or registration to work as site supervisor and is engaged on work for directing and constantly supervising day-to-day construction activity on site in accordance with the plans, specifications and instructions of the Architect.

F. Contractor :

Is a person having requisite skill, knowledge, experience and capacity to carry out the class of work which he has undertaken to execute by providing all necessary materials, plant, methodology, equipment and skilled/unskilled labourers as required for due performance of his obligation as person the plans, design, specification and instructions of the architect.

G. Occupier :

Is a person lawfully using the premises for the purposes for which is was intended and approved and for which occupancy certificate has been issued/accepted by the local statutory authority.

11.00 Functions and Responsibilities of Component Agencies :

11.10 Developer :

a) Shall possess legal (marketable) development right in the respect of the property intended to be developed.

b) Shall obtain all statutory permissions require for development in his name with the assistance of Architect and shall be responsible to fulfill and comply with all requirement, conditions or directions subject to which such statutory approvals are granted.

c) Shall comply with all the statutory requirements as might be applicable to the intended development.

d) Shall appoint a competent and resourceful architect depending on size and nature of project to plan, design and to render acceptance supervision in respect of intended development and shall provide all necessary information, data and documents to the Architect, relying on which the Architect can and may render his services and shall delegate all technical powers as per draft agreement. (Annexure III)

e) Shall appoint consulting structural engineers and other consultants competent as above in consultation with or through Architect.

f) Shall appoint experienced, skilled and competent contracting agency/agencies to execute the project/components thereof, in consultation with the Architect.

g) Shall engage a full time site supervisor for consultant supervision in consultation with Architect.

h) Shall display on site the approved plans and specifications.

i) If the developer himself undertakes the role of any agencies referred to herein-above by virtue of not engaging such independent agencies for the work, he shall be deemed to have assumed all the functions, liabilities and responsibilities of such agencies. Provided that if any in-house facilities are created by the developer to cater to the functions of such agencies, he shall be deemed to have not engaged such agencies. Architect, if appointed shall have overriding powers over functions assumed by developer.

j) Shall possess requisite license form appropriate authority to carry on such trade for sale of tenements/premises.

k) Shall obtain and submit to the Architect, completion certificate of contracting agency agencies, or his own to enable the Architect and other consultants to submit the acceptanc completion certificate.

i) Shall complete all the statutory requirements in respect of issuance of occupancy certificate completion certificate by Statutory local authority as the case may be.

m) Shall give possession of tenements to prospective buyers and complete all Statutor requirements of registration of society and transfer of the property etc. Within 12 month from the date of completion of the project completely and on such formation provide th society with copy of all architectural and on such formation provide the society with cop 11.21
of all architectural and consultants with the complete and fire fighting installation etc., an "DOS AND DONTS" prepared by Architect for the building in duplicate.

n) Shall be responsible for the rectification of all the defects for a period of 12 months fron the date of completion or longer so as to cover one full monsoon period arising out o defective workmanship or materials as person certificate of the architect.

o) Shall be responsible for major damage to building due to structural defects only for a perio of seven years from the date of completion subject to normal usage, wear and tear an other normal natural conditions.

p) The conditions of engagement, scope of work and the responsibility of the componen agencies other than developer shall be government by any written agreement between such agency and developer. The bonafide terms of agreement defining such conditions, scop of work and responsibility etc., which may be different and at variance than those in this code, shall supersede, over those in this code, whenever they are definitely and explicitly entered into. In absence of any written agreement the provisions of this code shall prevail

11.20 Architect :

a) The work of an architect is to study his clients needs and to advise, to prepare to direct and to co-ordinate design and to provide acceptance supervision works executed under the standard building contract subject to his conditions of engagement and scope of work assigned to him.

b) In absence of standard building contract between the developer and contractor/contractors the services of the architect shall remain as described under (a) provided that the powers vested in Architect which are developed in him by means of a standard building contract shall be deemed to be vested in him as if such contracts were executed.

c) The architect must have the authority of his client before initiating any stage of his duties. Any material deviation, alteration, addition to or omission from the approved design shall be made oily with knowledge consent of the client.

d) The Architect shall give such periodic acceptance supervision and inspection as may be necessary to ensure that the work are being executed in general accordance with the contract. Constant supervision does not form part of his normal duties.

e) Constant day-to-day supervision is necessary on all works, expect minor ones on which a licensed site Supervision shall be employed. He shall be nominated or approved by the Architect and be under the architects direction and control. He shall be appointed and paid by the client. Architect shall ascertain and satisfy himself that constant supervision is being done deligently & adequately.

11.21 Liabilities of the Architect :

The architect is liable if be fails to exercise all reasonable skill, care and diligence in the discharge of his duties under these conditions but the aforesaid liability shall be limited as stated here under :-

a) The liability of the architect does not cover costs other than those for the reinstatement of the works not exceeding one forth of his professional fees. All liability for consequential damages is excluded.

b) The liability of the architect expires after two years from the date of completion of relevant part of the work.

c) The Architect does not guarantee the work of any Contractor.

d) The Architect has no liability whatsoever for any part of the works not designed by him or not under his responsibility or which have not been constructed under his acceptance supervision.

e) The Architect has no liability whatsoever for any damage resulting from any act of contractors or suppliers which is not in accordance with the contract document or the Architect's instructions.

f) The architect has no liability whatsoever for any part of the work for which the liability rests with the Contractor or the suppliers.

g) The architect has no liability whatsoever for any violation of legal provisions or rights of third parties unless these provisions or rights have been specifically brought to the notice of the architect by the client in writing.

12.00 Quality Control By Architect :

12.10 Construction Stage :

i) Conduct the approved method of placing the main contract on behalf of the client (wit the assistance of a quantity surveyor if necessary).

ii) Analyse and report on the results of the approved method of placing the Main Contract and make recommendations to the client to assist in the final selection of the Main Contractor (with the assistance of a quantity surveyor if necessary). Of developer is to act as contractor architect shall insure that he has technical, administrative and material resources to execute the project.

iii) Supply to the Main Contractor, sufficient copies of the working drawings, schedules, specifications, Bill of Quantities (if required) and other contract documents to enable him properly fulfill his obligation under the conditions of the contract.

iv) Assist the Main Contractor to prepare a Works Progress Schedule.

v) Prepare and supply to the Main Contractor such further drawing, specifications or details may be required for the proper execution of the works.

Upon placing all contracts and supplying all drawing to the various contracts the Architect's services in connection with construction stage have been completed.

12.20 Supervision Stage :

i) Check and approve shop drawings submitted by Contractors wherever necessary with the help of Consultants.

ii) Give periodical acceptance supervision and inspection as may be necessary to ensure that the works are being executed strictly in accordance with the contract. Constant supervision does not form part of the duties undertaken by the Architect and his supervision alone cannot guarantee that the work is carried out strictly in accordance with the drawings and specifications.

iii) Direct the Site Supervisor and other site supervisory staff, to provide constant superintendence to ensure that the work is carried out strictly in accordance with working drawings and specification.

iv) Advise client on the progress and quality of the work.

v) Issue variation order on behalf of the client on client's instruction or on his own if changes are necessary for technical reasons.

vi) Certify accounts.

12.30 Consulting Structural Engineer/ Other Consultants :

The Scope responsibility and liability of the consulting structural engineer and other consultants shall be same as that of architect put only limited to specialised aspect of construction handled. All function, responsibilities and liabilities as prescribed of the Architect shall apply mutatis - mutandis to the consulting structural engineer and other consultants as the case may be subject to the provision that their services shall be executed under the general supervision and overall co-ordination of the architect. However, the overall co-ordination or general supervision by the architect shall not absolve the concerned professional from his direct responsibility for the designs, preparation of drgs and acceptance supervision thereof the discipline for which he has rendered the services.

12.40 Site Supervisor :

a) Shall be the person having requisite qualification experience and shall be duly registered/ licensed by the local statutory authority and appointed by the developer to work under overall control of Architect.

b) He shall exercise such powers, rights and responsibilities as may be assigned to him by the architect.

c) He shall be in overall charge of the site and shall be responsible for checking of material and workmanship and methodology applied for construction work.

d) Shall co-ordinate, direct and supervise personally all component of work needing his personal direction and attention in accordance with directions of the Architect, on full time basis.

e) He shall report to the architect/structural engineer/other consultants from time to time as may be specified or instructed.

f) He shall be responsible for co-ordinating the requirement of all consultants and Architect and shall maintain and be in custody of site instruction book.

g) He shall be responsible for the insistance of due compliance of instruction of architect / C.S.E./other consultants.

h) Shall submit a certificate of completion in the prescribed form of an effect that he has effectively supervised each component and total work executed and that he has personally ensured that all the materials used and workmanship are of accepted standards at the end of the work along with site instruction book to Architect and or other consultants as directed by the architect.

f) At the end of the work building contractor or in his absence developer and site supervisor shall give completion certificate in Prescribed Proforma to consulting structural Engineer who relying on these certificates may give completion certificate and stability certificate or refuse the same in writing giving reasons thereof as the case may be. Architect on getting all the certificates i.e. from developer or contractor/site supervisor, structural engineer plumber, electrician or other consultants may issue completion certificate or refuse the same in writing giving reasons thereof as the case may be. Provided that such refusal by consulting structural Engineer and Architect shall also contain the description of the shortcomings and remedial measures if any inclusive of reasons for its occurrence during the construction. On compliance of such requirements as specified in writing by architect consulting structural engineer or other consultants, concerned professional shall be bound to issue the acceptance completion certificate as early as possible but not later than 30 days after the compliance of suggested remedial measures.

g) i) At the end of the work, the architect shall give to the client in duplicate the following :

a) Dos and Dont's, for occupiers.

b) Maintenance manual.

c) Architectural completion drawings.

d) Structural and full service completion drags.

e) To issue certificate of defects at the end of defects liability period for rectification by Contractor if any.

Provided that in case of the Ownership buildings the documents as above shall be given to the society registered or proposed and one copy of 'Do and Dont's to each occupier on demand by charging the cost of such copy.

ii) For a period of 7 years from the date of completion architect shall maintain all important records in his office and shall furnish constructional information required by developer or society, available with him by charging costs thereof.

iii) Provided that all the copy rights of designs shall vest in the architects and drawings shall be deemed to be the property of the architects.

12.50 Contractor (Developer, if no contractor is appointed) :

(a) The duties, responsibilities and rights of the contractors shall be as person the standard agreements and conditions of building contract as adopted and approved by professional bodies with any modification for the time being in force. Specifically following shall be the pertinent clauses applicable over and above those in the standard conditions. Provided that when the intended development is to be carried out departmentally i.e. by giving labour contract or a contractor is appointed without proper documentation, through Architects the developer shall be deemed to be the contractor and shall bear all the responsibilities and liabilities of the contractor in accordance with a standard building contract as adopted by Indian Institute of Architects.

(b) On completion of the work the contract or shall submit to the Architect a certificate of satisfactory completion of work in the prescribed proforma to an effect that all the materials used are as person specifications and whole of the workmanship is good and of accepted standards.

(c) Completion Certificate No. to absolve :

The certificate of completion of works referred to in sub clause (b) above of its acceptance by architect shall not absolve the contractor from his liability to make good any defects, imperfections and shrinkage's of faults which may appear during the defect liability period and such defects, imperfections, shrinkages or faults upon the directions in writing of the Architect, shall be a mended and made good by the contractor at his own cost. In case of default the part of the contractor, to so make good the defects or deficiencies, the Architect may on behalf of or through developer employ labour, plant and machinery and materials or appoint another contractor to amend and make good such defects, imperfections, shrinkage's and faults and all expenses consequent thereto and incidental thereto shall be borne by the contractor and shall be recoverable from contractors under the contract including security deposit or from any moneys due to the contractor from the employer under other contract, or as a debt due.

(d) Safety Provisions

The contractor shall at his own expense, arrange for the safety provisions incorporated in safety code hereinafter or as required by any Law for the time being in force in respect of labour directly or indirectly employed for the performance of the work and shall provide all facilities in connection therewith. Precautions in the safety clause are the minimum necessary and shall not preclude the Contractor taking additional safety precautions as may be warranted for the particular type of work. Also mere observance of these precautions shall not absolve the Contractor of his liability in case of loss or damage to property or injury to any person, including Contractor's labour, Employer's Supervisor or any member of the Public or resulting into death of any of these. Relevant I. S. Specifications shall be followed in this regard.

12.60 Occupier :

A) Shall use the premise diligently and for the purpose for which it is designed and intended

B) Shall maintain the premises in proper condition and observe all the suggestions given i DOS and DONT'S, issued by Architects.

C) Shall not make any alteration in the structure including chasing or cutting in any walls R.C.C. Pardi, Columns, Slabs or provide any additional lofts, walls or structure increasing the dead load without obtaining permission from the Architect of the building and or owner developer or society. The owner/developer/society shall not give any such permission without consulting and taking due concurrence from architect or other concerned professional as the case may be.

D) Will not make any alteration in Bath room such as changing the tiles and sanitary fixtures, fitting etc., without due permission of and information to the architect, as may such work is likely to damage the waterproofing. Architect shall not issue such permission unless he is satisfied that work is proposed to be carried out through proper and competent agency in order to ensure that proper waterproofing is carried out and tested before refixing such tiles or fittings & fixtures.

13.00 Safety Code :

A) Suitable scaffolds shall be provided for workman for all work that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical).

B) Scaffolding or staging more than 3.25 metres above the ground or floor, swung or suspended from an overhead support or erected with stationary support, shall have a guard rail properly attached, bolted braced and otherwise secured at least 1 metre high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

C) Working platform, gangways and stairway shall be so constructed that they do not sag unduly or unequally, and if height of a platform or gangway or stairway is more than 3.25 meters above ground level or floor level, it shall be closely boarded, have adequate width and be suitably fenced, as described in 2B above.

D) Every opening of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be other 9 meters in length. Width between side rails in a rung ladder shall in no case be less than 30 cms. for ladders upto and including 3 meters in length. For longer ladders this width shall be increased at least 6 mm for each additional 30 cm of length. Uniform step spacing shall not exceed 30 cm.

E) Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the Sites shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect public from accidents and shall be bound to beat expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action or proceedings to any such person or which may with consent of the contractor be paid to compromise any claim by any such person.

F) Excavation and Trenching : All trenches, 1.5 meters or more in depth, shall at all times be supplied with at least one ladder of each 30 meters in length or fraction thereof. Ladder shall be extended from bottom of trench to at least 1 meter above surface of the ground. Sides of a trench which is 1.5 meters or more in depth shall be stepped back to give suitable slope, or securely held by timber branching, so as to avoid the danger of sides collapsing. Excavated material shall not be placed within 1.5 meters or edge of trench of half of depth of trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances shall undermining or undercutting be done.

G) Demolition : Before any demolition work is commenced and also during the progress of the work :

i) All roads and open areas adjacent to the work site shall either be closed or suitably protected;

ii) No electric cable or apparatus, which is liable to be source of danger, used by operator shall remain electrically charged;

iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion, or flooding. No floor, roof, or other part of a building shall be so overloaded with debris or materials as to render it unsafe.

H) All necessary personal safety equipment as considered adequate by the Engineer-in-Charge shall be available for use of persons employed on the Site and maintained in a condition suitable for immediate use; and the contractor shall take adequate steps to ensure proper use of equipment by those concerned.

i) Workers employed on mixing asphaltic materials, cement and lime mortars/ concrete shall be provided with protective footwear and protective goggles.

ii) Those engaged in handling any materials which is injurious to eyes shall be provided with protective goggles.

iii) Those engaged in welding works shall be provided with welder's protective eye-shields.

iv) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficient safe intervals.

v) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that manhole covers are opened and manholes are ventilated at least for an hour before workers are allowed to get into them. Manholes so opened shall be cordoned off with suitable railling and provided with warning signals or boards to prevent accident to public.

vi) The Contractor shall not employ men below the age of 18 and women on the work of painting with products containing lead in any form. Whenever men above age of 18 are employed on the work of lead painting, the following precautions shall be taken :

A) No paint containing lead or lead products shall be used except in the form of paste or ready mixed paint.

B) Suitable face masks shall be supplied for use by workers when paint is applied in the form of spray of a surface having lead paint dry rubbed and scrapped.

C) Overalls shall be supplied by the Contractor to workmen and adequate facilities shall be provided to enable working painters to wash during and on completion of work.

I) When work is done near any place where there is risk of drowning all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

K) Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following :

i) These shall be of good mechanical construction sound material and adequate strength free from patent defects and shall be kept in good repair and in good working order.

ii) Every rope use in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.

iii) Every Crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years shall be in charge of any hoisting machine including any scaffold winch or give signals to operator.

iv) In case of every hoisting machine and of every chain ring, hook shackle swivel and pulley block used in hoisting or lowering or as means of suspension, safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with safe working load. In case of hoisting machine having a variable safe working load, each safe working load the condition under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond safe working load except for the purpose of testing.

v) In case of departmental machine, safe working load shall be notified by the Engineer-in-Charge. As regards Contractor's machines the Contractor shall notify safe working load of each machine to the Engineer-in-Charge whenever he brings it to site of work and get it verified by the Engineer-in-Charge.

K) Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards; hoisting appliances shall be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When are already energised, insulating mats, working apparel such as gloves, sleeves and boots, as may necessary, shall be provided. Worker shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

L) All scaffolds, ladders and other safety devices mentioned of described herein shall be maintained in a safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near places of work.

M) These safety provisions shall be brought to the notice of all concerned by display on a notice board at a prominent place of the works spot. Persons responsible for ensuring compliance with the Safety Code shall be named therein by the Contractor.

N) To ensure effective enforcement of the rules and regulations relating to safety precautions, arrangements made by the Contractor shall be open to inspection by the Engineer-in-Charge or his representatives and the Inspecting Officers.

O) Not withstanding the above conditions A to N the Contractor is not exempted from the operation of any other Act or Rule in force.

17th June 198

HOUSING INDUSTRY IN BOMBAY IMPORTANT ISSUES NOT COVERED I ACCEPTANCE SUPERVISION :

It is an unfortunate commentary on human nature and the psychology of the individual that w need construction inspection but need it we do. The present modus operandi, specially in the fiel of Housing Construction in private sector, affects lakhs who have to depend on Builders Developers to buy the same "as is where is". A sound economy is supposed to be built on th roles of "Buyer" and "Seller" and all have to play their part. The rule of "Caveat Emptor" (le the buyer beware) has to be not philosophical, but legal. In construction where the product i built in place and often takes years to develop, the "Buyer" should have an unusual opportunit to look over the shoulder of the "Seller". Unfortunately both the above are not to be as is know to most.

It is in the face of the above that the real and accepted need for construction inspection b accredited and responsible "Agent" i.e. Construction Inspector/Supervisor/Clerk of Works".

Some Owners/Developers/Builders do have highly developed construction Management and Construction Supervision Teams as part of their internal infrastructure. It is the small Owners Builders who lack in this. However, in a few instances in the first case and more so in the second case the lack of responsible supervision have resulted in buildings of not too acceptable a standard.

The major areas which are affected on account of these can be broadly described as under :

i. Site measurement and sitting of building with respect to open spaces and centres of R C C columns, and verification of the same on each floor successively as work proceeds.

ii. Proper mixing of concrete for R C C frame members.

iii. Proper centering and shuttering.

iv. Control of water/cement ratio and adequate mixing time.

v. Proper attention for the need to keep forms for specified periods.

vi. Proper construction of masonry units with due care to inter-bonding and bonding at junction of RCC members, alignment, raking of joints between masonry units and curing of the completed masonry.

vii. Proper control in plastering including alignment, bonding into backing material, curing etc.

viii. Due care for water proofing of toilets and terraces including water storage tanks.

ix. Proper execution of plumbing work including proper joints of various units.

x. Prevention of damage to structural R.C.C. members for concealed electrical wiring and concealed plumbing.

xi. Finishing the Building in a workman-like manner.

These are only a few of the finer points which constitute contribution required by onsite responsible continuous construction supervision/Inspection, which certainly cannot be expected of licensed Surveyors/Architects and Registered Structural Engineers.

While the role of construction supervisor is basically quality control, the successful supervisor must be concerned with job co-ordination. Co-operation and co-ordination are inter-dependent and depend upon the personal relationships, as well as professional relationships which the inspection team builds with the owners designer and contractors.

It is with the above in mind, our Professional Bodies felt that some control needs to be evolved for continuous on site responsible supervision on construction sites and has therefore submitted Draft Proposal for giving due consideration by the Authorities viz. Municipal Corporation of Greater Bombay.

It is our feeling that if introduced, as suggested, there will be marked improvement in quality and durability of structures constructed thereafter, though in a progressive manner, for lakhs of people who are the actual users, particularly in private housing sector.

Note Jointly prepared by PEATA

Institution of Engineers (I) Maharashtra State Centre.

Institute of Architects (I)

PRACTISING ENGINEERS ARCHITECTS AND TOWN PLANNERS ASSOCIATION

June 11, 1985.

Mr. J. R. Patwardhan,
Director of Engineering Services and Projects,
Municipal Corporation of Greater Bombay,
Bombay 400 001.

Dear Sir,

This hare reference to the various meetings with your goodself attended by members of ou Executive Committee and Members of Structural Engineers Sub Committee, when we had bee representing our view point about need for effective and continuous responsible supervision o construction in Bombay.

We have now involved a draft proposal after long deliberation amongst our members and subm herewith for your perusal and action your deem fit.

For any further discussions you need our presence for further clarifications, elaborations on th prepared draft we shall be too willing to attend such meeting/meetings.

Thanking you for the patient hearing to our problems that you have accorded to us.

Very truly yours,

Sd/-

PRESIDENT

ENCL : DRAFT PROPOSAL

PRACTISING ENGINEERS ARCHITECTS AND TOWN PLANNERS ASSOCIATION

DRAFT PROPOSAL FOR PROVIDING PROPER AND CONSTANT SUPERVISION ON BUILDING CONSTRUCTION SITE BY MEANS OF AGREEMENT BETWEEN ARCHITECT AND DEVELOPER ALONG WITH REGISTRATION/LICENSING OF BUILDING/DEVELOPER.

INTRODUCTION :

The pace of urbanisation in the country has accelerated in a manner to outstrip the supply of constructed building. This has resulted in the tremendous acceleration of building activities mainly being sold on ownership basis.

For obvious reasons, the profit, being on amongst them, people from all walks of life, business and industry are attracted towards the activity of buildings development, both residential and commercial and at time even industrial. In most cases these individuals or their firms lack even basic qualification/experience necessary for being involved in the activity of building construction while employing only labour contrasting Agency to man and control the work of construction of even large complexes.

In earlier years all construction were carried out by means of entrusting the work of the firm of building contractors of long standing and repute, whose Partner/Directors had necessary technical background and experience. Above arrangement was envisaged by means of a contract and condition of contract provided for the appointment of clerk or work/supervising engineer, and responsibility on the contractor to do the work as person designs and specification, payment only on certification by architect and over all defect liability of material and workmanship being the sole responsibility of contractors.

It is common experience these days to find that in case of most of construction works by builders/ developers this contracting agency is absent replaced by only labour contractor and builders/ developer themselves performing the partial task of building contractors namely building material supply and partly the type of so called supervision themselves which cannot be termed as proper and adequate supervision to ensure the quality and durability of structure.

This has resulted into total removal of any meaningful authority in the hands of Architects/ Consultants from the inspection of materials and workmanship to the payments thus depriving the technical personal engaged in designing the buildings of adequate authority. The supervision exercised by designers is periodical and in the nature of acceptance supervision and thus a very vital and important link of knowledgeable and responsible adequate constant site supervision is missing in most of the projects today, which has contributed as a major cause of deterioration in the standard of construction.

The problem of deteriorating standard of building arising out of tremendous increase in building activity due to various reasons many times results into total disregard to the quality of construction and its future life. The general public buying flats on ownership basis are many a times faced

with the problem of repairs in a very short time due to deterioration even after investing the life savings. Last two decades or so have witnessed the fast deteriorating standard of buildi construction and consequent spate of recent building collapses in the country, inclusive Bombay.

The correct and suitable type of building designs and construction requires followings :

A. Proper building design as person regulations and codes.

B. Proper agency to supervise the work and inspection of materials.

C. Proper agency to carry on the work.

D. Proper and correct supply of building materials

In case of Developers/Builders the most of the work as mentioned in item b.c.d. are being don by themselves and architects and engineers are appointed for designs and statutory submissio and certifications as required by regulations.

In order to bring about satisfactory and just solution of such problems the following remedia measures are suggested bases on the requirements of good, sound and economical constructio practice.

II. PRESENT SITUATION VIS-A-VIS ACCEPTANCE SUPERVISION BY ARCHITECTS & CONSULTING ENGINEER :

The present Bye Laws of the Municipal Corporation of Greater Bombay, provide for licensing registration of architects / surveyors and consulting structural engineers respectively. There is n provision in present bye-laws for ensuring responsible and effective day to day constan supervision of private construction in Bombay.

The supervision that can physically and probabilities be expected of architects/consultin structural engineers is only guidance "Acceptance - Supervision", which can enable to exercis a general control and exclude only major deviations from their drawings and/or only major flaw in construction provision at site.

The stability and completion certificates are issued by architects and engineers, on the basis o general inspection and in good faith that the materials used and workmanship engaged is as pe specification laid down, and to the best of their knowledge and behalf. The acceptance certificate do not reflect the inherent defects left in the buildings constructed with substandard materials unskilled labour and inexperienced supervision.

III. WHETHER THE SITUATION UNDER II ABOVE IS ADEQUATE AND WHAT IS EXPECTED OF ARCHITECTS AND CONSULTING ENGINEERS AS TO LIABILITY OR OBLIGATION TO SUBSTITUTE CONSTANT SUPERVISION.

Some of the finer points of which good construction can accrue as detailed below, can be achieved and implemented only through responsible constant supervision.

IV. PREL

A. Control of water-cement ratio in manufacture of concrete.

B. Mixing placing, compacting and curing of concrete.

C. Proper cover to reinforcement bars.

D. Adequate centering and shuttering for concrete.

E. Good principles of construction and their methods for masonry work, plaster work, etc.

F. Proper execution of carpentry work.

G. Adequate waterproofing of terrace, water tanks and toilets.

H. Sanitary and plumbing work using proper materials and joining of pipes.

It is in these and many other points of good construction practice, when taken care of will decide the overall function of a structure and the welfare of the people who will occupy them.

In construction projects of Public Sector, each site is being constantly supervised by an engineer of no lesser cadre than deputy engineer with at times a full division of circle being created for constant supervision depending upon the quantum of work. This is over and above contractors' own cadre of engineers and the contract being awarded to only those contractors registered in specific category based on quantum of value of the work.

The sub-division or division or circle of the supervising agency is different from the Design/ Planning cell and is superintending over the specified class of contracting agency.

One needs to just think whether the vacuum created by absence of both these agencies in private sector, can be expected to be filled by Architects/Consulting Engineer.

IV. THE BENEFITS ACCRUED TO GOOD CONSTRUCTION OUT OF THE INTRODUCTION OF REGISTRATION OF CONSULTING STRUCTURAL ENGINEER.

In early seventies the MCGB, introduced registration of Consulting Structural Engineers prior to this the structural designs were being submitted by the Architects under their signatures. At times these structural designs were being obtained from person of inadequate experience. However, with the introduction of registration of consulting structural engineers, the practice of getting structural design at times from in-experienced engineers in this particular field has been automatically eliminated.

There now is awareness amongst consulting engineers towards responsible and matured performance reflected in the quality of structural designs, their implementation on site and other aspects related to it since now they have a direct control and responsible towards its sufficiency.

PRELIMINARY :

The suggested remedial measure are based on present practice and on availability of qualified technical persons to act as clerk of work. This can be achieved by various means, as such 2

alternatives are given. One which does not need any change in statutory provisions and other which necessitates such changes. The suggested measures are for new construction only and will have to enforce in stages so as not to create any undue hardship.

ALTERNATIVE I : (without any statutory changes)

In approval of the plans the buildings to be constructed for sale on ownership basis, irrespective of its user, following may be followed including stating name, address and full details of the Developer :

1. Insistence of details of constant site supervision during the period of construction.

   This may be done in two ways :

   By providing for specific agreement between Builders/Developer and Architect for

   a. Appointment of clerk of works.

   b. By construction management contract.

2. Condition in IOD, to disclose the name and qualification of site supervisor with residential address in the notice for commencement of work along with details specifying whether work is done by labour contract or contract with materials.

3. Acceptance of supervision memo of the Architect to be accompanied by agreement of following categories and described in sub-head VI.

   A. Below 15 mt. Height.

   B. Above 15 mt. Height but below 30 mt. Ht.

   C. Above 30 mt. Ht.

ALTERNATIVE II :

If steps taken as suggested by alternative I do not bring the desired results that the alternative II may be followed and enforced within the period of three years so as to avoid any undue hardship.

1. Registration/licensing of builder/developer by making amendment to schedule M of section 394 of B.M.C. Act of 1886 and making it compulsory for builder/developer to take license to carry on trade of building units on ownership basis. Such licensing should be for the firms. The administration, its conditions etc. should be handled by the building department of BMC and not the licensing department.

2. Registration of clerk of works in cat. I & cat. II for building above 30 mt. Height and 15 mt. Height.

The following consideration and evaluation of function of each discipline connected with building design and construction is described.

DEVELOPER :

a developer is self employed turnkey contractor supplying self content finished flat forming a part of building, for consideration. As such it is a process of supplying a constructed portion of a building alongwith land by arranging to transfer the land component of the premises directly from original land owner to the society or final occupants by holding irrevocable power of attorney from the original land holder and due to this for all purpose of fulfilling Statutory requirement of construction over the land under the control and ownership of the original land owner he is deemed to be land holder with an intent to develop the land by construction thereon and sell it as it as different tenements or units dividend into self content smaller units comprising of a part of building. This necessitates that since he acquires all building materials, land and the service of technical personnel inclusive of Architect, he is the final responsible person answerable to authorities and society for his commissions and omissions if any and must indemnify the authorities, technical personal and his client (purchaser) and society.

The task performed by him being entrepreneurial in nature cannot be controlled or regulated by means of imposition of conditions of technical competence. Nowhere in the world such condition are envisaged and imposed entrepreneurs. However he can be held responsible for his commission and omissions made for accelerating his profits resulting into conditions detrimental to public safety and health for short or long terms. By very nature of his work his own interest may clash with the overall interest of the society. As such when he performs the task of building constructions it should be done under the supervision of Architects and public officers alongwith necessary safeguards.

ARCHITECT :

generally Architects are appointed by developers. The Corporation approves the plan mainly on two consideration apart from observance and compliances of regulations.

A. That the plan are prepared by competent persons - vis L.S.

B. That a competent persons - vis L.S. has agreed to supervise the work.

By virtue of the professional code and practice involved during last 1.1/2 century terms of the engagement of Architect and other consultant on building designs do not anticipate and provide for day to day supervision on construction. The supervision by Architects and structural designers and other consultants is "Acceptance - Supervision" and not day to day supervision. This procedure did not create any problems earlier because all the works were carried out by contractors and as such under conditions contracts a clerk of work or a supervising engineer working under the Architects was envisaged to ensure the compliance of regulations and the quality of work. Recent practice of carrying out the work under the labour contract from last 1.1/2 to 2 decades

have created vacuum of supervision agency resulting in the deterioration in the quality o construction work, and to the state of affair as exist today.

Architect is an agent of client. He derives his powers by virtue of his appointment as an Architec and his terms of engagement do not clearly provide for his right, duties and liability of constructio site which was clearly defined in the condition of the contract. Under the circumstances it i suggested that the B.M.C. should take following steps.

For approval of building plans while taking supervision memo, an agreement between developer owner and Architect making the detailed provisions of the line of condition of contracts as pe the draft agreement annexed hereto providing for purchase of materials from suppliers and providing for the constant supervision by competent supervisors at the cost of owner/developer or by virtue of an agreement for construction, or by management contract between owner developer/Architect be considered to be satisfactory for proper supervision of construction work. This procedure will ensure proper powers in the hand of Architects and consultants for the purpose of acceptance supervision.

CLERK OF WORKS :

Clerk of work is a representative of Architect, generally performing following functions :

a. Inspection and approval of materials brought on site for the construction.

b. Supervision and control over the workmanship of different contractors and connected with building construction.

c. Co-ordination between Architect, consultants/clients, contractors etc.

d. Performing such other functions as may be directed by the architects.

As such he is the main link in translating the designs, specifications, details and directions given by Architects and other consultants.

VI. GUIDELINE FOR THE APPOINTMENT OF CLERK OF WORK :

Clerk of work being an important personnel on site should possess following abilities depending on the complexity and exigencies of the work involved on a construction site. Generally he should possess :

a. Ability to read plans and specifications and translate them in reality.

b. Determine any discrepancy or anomally in drawing and seek directions from Architect or consultant as the case may be.

c. Knowledge of correct gradation of type of materials being used in constructions and its proper and quick assessment.

d. Knowledge of workmanship of different trades involved in the following construction.

e. Ability to take correct measurement to check the center line of different structural members involved.

f. Ability to control labour.

g. Ability of properly give report in writing to Architect or consultant as per their requirement.

CLERK OF WORK GRADE : I

For building above 30 mt. ht. or any other building involving complex designs.

B.E. (Civil) or B.Arch. or any other equivalent recognised qualification with minimum 10 years experience after graduation on planning, design or execution of building.

CLERK OF WORK GRADE : II

For building above 15 mt. ht. but below 30 mt. ht. B.E. (Civil) or B.Arch. or any other equivalent recognised qualification with minimum 3 years experience after graduation.

OR

Diploma or Licentiate in Civil Engineering or Architecture with 6 years experience.

OR

A person who has worked as supervisor and has minimum 10 years experience who in the opinion of the Architect is capable of performing the duties given to him irrespective of his qualifications.

CLERK OF WORK GRADE : III

For building upto 15 mt. ht. B.E. (Civil) or B.Arch. or any other equivalent recognised qualification with one year experience after graduation.

OR

Diploma in Civil Engineering or Architecture with 3 years experience.

OR

A person who in the opinion of the Architect is capable of discharging his duties with practical experience of 3 years or less irrespective of his qualifications.

Save and except exceptional circumstances no person who does not know how to read and write will be appointed as clerk of work.

EXTRACT FROM THE PAPER PRESENTED IN THE NATIONAL "SEMINAR ON LESSONS FROM FAILURES OF STRUCTURES" AT BOMBAY, 17-19 DECEMBER, 1982

CAUSES, RESPONSIBILITIES AND INDICATORS TO SCIENTIFIC INVESTIGATIONS AND STUDY OF FAILURES.

CRISES OF FAILURES :

J. R. PATWARDHAN :

DIRECTOR, ENGINEERING SERVICES AND PROJECTS,

MUNICIPAL CORPORATION OF GRATER BOMBAY.

In order to understand the anatomy of failure in our construction industry, we have to review the input factors which contributes to and constitute the industry. From planners, engineers and contractors there are various stages of inputs. Many failures occur due to lapses in temporary construction techniques like scaffolding, shuttering, shoring, underpining etc. which are few of the main inputs. Some causes of failure are attributable to the workmanship and use of materials which forms permanent construction while as others are attributable to the design deficiencies

CONTRIBUTORS TO CONSTRUCTION INDUSTRY AND THEIR STATUS :

(a) Professionals :

Though Architects and consulting Engineers may be registered with appropriate public bodies for carrying out various works in the Private Sector, their experience and background may not qualify them to undertake the job assign to them or secured by them. It may be, appropriate to have various levels of technical personnel or registration and classification e.g. Consultants can be classified in different categories like "general", "specific" and "special". Similar classification can be applied to the Architects. Normally the problem of structural failure will not arise in case of Architects who are not qualified to deal with the problem of stability of the structure. The responsibility is and should be shared by the structural engineer.

For Public Sector Works, there are various levels of responsibility. The necessity of registration of Engineers and Architects may not arise in such cases. However, Government may seek guidance/assistance from private sectors/special agencies if there is no in-house expertise to tackle unusual or highly specialized jobs.

(b) Contractors :

The contractors are normally registered with the Public Bodies and / or the Government when they carry out the jobs. Their gradation is fix on the basis of their technical experience, resources and manpower. However, considerable contribution in this industry is also due to the activity in

the private sector, where there is no registration for contractors. Any one who is capable who invest and to organise construction job becomes a developer or a builder. Here the identity of the client and the contractor fuses into one.

This class of client operates through a labour contractor and on some occasions they employ young professionals as their Architects and Consulting Engineers who find it difficult to exercise technical control over them as regards quality of workmanship and basic safety standards for obvious reasons.

SCOPE AND RESPONSIBILITY :

Though Architects and Structural Engineers are registered in the broad sense, they are only responsible for "Acceptance Supervision". They are not responsible for day to day supervision which in fact is the obligation of the contractor who undertake the job. The professional is responsible for the overall control and general supervision to insure that the general quality is maintained and work is executed as per drawing and details shown therein. Definite responsibility has to be fixed on the contractor for non-compliance of drawings supplied or for basic standards of workmanship including safety requirements.

Large numbers of failures in private sector have taken place mainly due to the ignorance of such type of Labour Contractors / clients who have entered the industry without the proper technical background, and without awareness of various safety standards. It is interesting to note the requirements for running an ordinary chemist's shop. One gets a chemist's licence only when he engages a qualified chemist and he works full time and signs various prescriptions of having issued the required medicines. In fact medicines are issued by the chemist against prescription, and there is no apparent need for a licensed chemist full time on the job. But, vary prudently this enactment is insisted.

In this contest Civil Engineer is a hazardous profession dealing with innumerable factors individually and in combination. No single individual is able to conceive and implement any Civil Engineering Project without the involvement and participation of various organisations and /or individuals. Dealing with so many variables, Civil Engineering Failures tend to be blown out of proportion.

REVIVE OF FAILURES :

With the experience of failures which have occurred of late in the industry is has been necessary to first assess whether the concerned technical person responsible for the basic scheme has judiciously used all available knowledge cases the intensity of the damage co-related with intensity of the stresses and strains due to natural forces has to be worked out. This would serve as a good guide for future.

These type of investigations do have certain short-comings in the court of law. If there are casualties, the matter usually goes to court of law. In case of public pressure Enquiry Commissions

may be appointed. Investigations, then take a different turn. Technical Committee conducts i investigations and submit its findings to the authorities are the clients. Then law takes over eith either in the court or in 'commission', which views the total aspect in legal language only. Th court or the commission is normally guided by the 'findings' of the technical committee. Howeve it is their own discretion to decide the issue. This is where the whole problem lies. Judges a human beings and are likely to be carried away by the manner in which the matter is presente to them by the lawyers. It is usually a battle between technical aspects and legal representatio of the same which may miss certain important clues either inadvertently or deliberately. At th stage, it is necessary to realise how important it is for Engineers to be made aware about thes legal procedures and steps they may be required to take to guard their own interest logically an within the frame work of law.

OUTCOME :

It is obvious that we must accept the fact that failures are a part of our life. Let us therefore evolv procedure to face them. One should have correct guidance and protection from seniors and fron professional institutions for following correct methodology of investigations and prope interpretation of technical and legal aspects.

ANNEXURE - III

MAJOR POINTS TO BE INCLUDED IN THE CONTRACT FOR SUPERVISION BETWEEN ARCHITECT AND OWNER / DEVELOPER.

1. Owner/developer being desirous of constructing the building for which he has made application to local authority and appointed Shri _____ as his/their Architect and in order to make proper arrangement for day to day supervision of the intended work following arrangement is hereby agreed upon.

2. Architect supervision will be periodical and acceptance supervision depending upon the nature and progress of the works, but he will at least visit the site minimum once in month or 15 days as per the requirement to be determined by Architect at his discretion.

3. Owner/developer will employ full time clerk of work or supervisors as per the advice of the Architect at a salary as adviced by the Architect who will be responsible for day to day supervision and control the quality and workmanship of construction on site. The clerk of works/supervisors shall be directly under the control and instruction of the Architect who will decide the timing, nature and scope of the work of supervision, reporting procedure from supervisor to Architect or consultant, type of works to be carried out in the physical presence of supervisor etc. Any other contractors working on their building construction site shall be given the work subject to this stipulation by the owners as per the advice given by Architects.

4. Architect shall have right to dismiss, suspend, replace any other worker inclusive of supervisor who at the decision of the architect is not capable of doing work properly and who does not follow / is not capable of following instructions and directions given by the Architects.

5. Architect at his discretion whenever finds that the work or part of the work is not as per the design and the specification shall have right to reject the same and owner in case of departmental work and contractor in case of contract shall remove and replace the rejected work and if so adviced by Architect, shall take all necessary remedial measure to bring the work to the required standard as may be required to enable the Architect to accept the same may be required in accordance with any Statutory code and standards.

6. The owner / developer hereby declares and indemnifies Architect that he will not purchase sub-standard materials for the intended constructions to the best of his knowledge. Any materials found unsuitable by the supervisor or Architect shall not be used in the above construction.

7. Any decision affecting quality of materials and workmanship taken by previous supervisor and confirmed by Architect or previous Architect shall not be varied by new supervisor or new Architect appointed in case of termination of services of supervisor or Architect or consultants. Unless and until the decision taken earlier are found to be taken in contravention of Statutory code as may have been approved by the Statutory authority.

8. In case of absence or resignation of the supervisor on site, the construction work sha remain suspended till satisfactory alternative arrangement is made to the satisfaction the Architect.

9. Based on above agreement and understanding Architect have agreed to sign th supervision memo to be submitted to the authorities for the purpose of approval of th plans subject to the owner/developers' right of termination as per the terms and conditio of the engagement of Architect /consultant.

10. The supervisor or the clerk of work shall be deemed to be the Architects' representativ on site subject to the power authority assigned that may be delegated, to him from tim to time writing by the Architect.

10. (A) The Architect may at his discretion delegate the power and authority vested in him b virtue of this agreement to other consultants from time to time in writing.

11. Any written or oral instructions given by the clerk of work shall be as though it had bee given by the Architect provided as follow :

11. (a) Failure of clerk of works to disapprove work or materials shall not prejudice the powe of Architect thereafter to disapprove such work of materials and to order the pulling dow the removal or breaking up and opening out of the work for inspection at owners cos

11. (b) Owner or contractors working on site if be dis-satisfied by reason of any decision of th clerk of work, shall be entitled to refer the matter to the Architect who shall thereupo confirm reverse or vary such decisions.

12. This agreement is supplementary to the terms of engagement of the Architects and ca be terminated by either party by giving 3 months notice with a copy of such notice t be forwarded to BMC.

13. Any dispute etc. shall be decided by arbitration. In case of dispute in between the work the work to continue during the arbitration proceedings, unless the contract is properl terminated.

14. Appointment letter to clerk of work shall be issued by the Architect countersigned b owner/developer in confirmation thereof. The appointment shall specify the detail o scope of services, duties, responsibilities, right and emoluments to be given to the cler of work. The payment of salary / emoluments to clerk of work shall be done throug Architects only.

15. In case of labour contract work, owner/developer, and in case of contract with materials contractors, shall be responsible for taking out suitable insurance cover for workme compensation, accident and third party risk inclusive that of injuries that may be sustaine by Architect, consultant or their agents or servants. A copy of such insurance covere shall be deposited with Architect.

SESSION III

STATUTORY RESPONSIBILITY AND LIABILITY

PANELISTS

DR. ROSHAN H. NAMAVATI

SHRI NATUBHAI BADHEKA

SHRI JASUBHAI SHAH - Solicitor

SHRI BANKIMCHANDRA P. KHONA - Solicitor

SHRI E. Y. PRASADE - Chief Engineer (D. P.)
Municipal Corporation of Greater Mumbai

SHRI KIRTY DAVE

TECHNICAL SESSION III

Statutory Responsibilities and Liabilities :

Architect/Engineer is the Technical Agent or Agency of the client imparting services as described in the contractual Documents for a consideration as enumerated therein.

Such services do attract several contractual as well as statutory responsibilities and liabilities which if not discharged in a proper manner makes architect responsible for damages and other statutory penalties. Work of the architect being complexed one requires him to be adequately informed or general statutes and of the statutes governing and controlling the development in particular.

There are three fold Responsibility and Liability.

A. One imposed by his scope of services, arising out of contractual designation with client and Building Contract.

B. One imposed by Building Regulations and other statutes.

C. One imposed by The Architect Act and Regulations of membership of Professional Institution.

A. Arising out of the Scope of the Services

This Liability/Responsibility solely depend on the extent of the professional engagement of the Architect. The scope of the Profession is ever expanding to comprehensive service to Design-built, Turnkey Assignment to Construction Management, Project Management, etc. It becomes easier for one to determine their own liabilities if the same is in writing. Any oral or implied Engagement gives rise to misunderstanding, disputes and consequent legal actions, harassment and time consumption apart from financial implication.

The normal package of the services as being practiced except in for few cases do not include comprehensive services and as such unless specifically reduced in writing the Architect exposes himself to greater liabilities due to his profession and calling.

When a person calls himself and "Architect" it implies that he possess skill and ability, including taste and aesthetic, sufficient to enable him to perform professional services at least ordinarily and reasonably well, but undertaking does not imply or warrant a satisfactory result (just like Lawyer or Doctors). What is required is reasonable care and competence exercised by any other person in the same profession. However, many professionals undertake the services without proper and many times inadequate writing detailing the work to be done by the professional and the information or data to be supplied by the clients. This results in quite a confusion client presuming that everything will be done by the professional engaged.

In the present scenario following things are not adequately described in the contract between professional and client.

- ❑ What are the services to be provided.
- ❑ To what extent does the client authorises Architect to act as clients agent. e.g. with builder, Govt. Authorities, other consultants etc.
- ❑ To what extent Architect can vary design on his own violation.
- ❑ To what extent the Architect is to be paid if clients desire changes in Design.
- ❑ Is there any budget, if so, based on which items.
- ❑ Extent of Architects Responsibility to liaise with/integrate the professional services of other consultants and nominated sub-contractors - supplier.

- What services are to be provided during the construction.
- Within what time frame the client to consider an Architects submission and give instruction.
- Is Architect entitled to interest on overdue payment.
- If the project period is extended is Architect to be paid for extended period, by additional payment.
- If the delays are beyond Architects control is he entitled to additional payment.
- Can there be assignment/novation.
- Is the Architect to limit the liability in time and amount.
- Should Architects name be included or not in an advertisement of Project.
- Is confidentiality to apply and if so, to what extent.
- How are notices to be given under the agreements.
- Can Architect suspend his services for non-payment if so, how and why and in which manner.

Above are the few samples of issues which have yet not been addressed by the Standard form of engagement in vogue. The major misunderstanding being the one in which there is always a dispute between Architect and client in obtaining Statutory Approval and its time frame, which is beyond the control of the Professionals.

Most of the clients fail to understand that Professional is assisting the client as well as authorities in securing and obtaining statutory approvals and permissions for which the client is the applicant and Architect passes on the required data or information supplied by the client or his agent in good faith for which many times Authorities hold them responsible for mis-representation and starts the legal or disciplinary actions. In present circumstances in absence of proper building contracts and certification of payment being removed from the professional which is exercised either by the client or his technical staff or department as in the case of Public Agency, Architect has no authority or leverage to enforce any decision during construction period. The powers as given to the Architect is arising out of building contract under which he acts as referee or quasi arbitrator between the client and contractor.

The administration of building contract as hitherto being in the hands of the Architect is being increasingly changed and given to the Project Management consultants or Construction Management Consultant still the Architect is held responsible. This situation must be pondered upon and norm that Architect is supervising the construction does not reflect reality. In the periodic visit all that the Architect can do is to observe the work which should get reflected in assignment and the present legal format of building approvals which also recognises the same in implied manner.

Statutory advice as to the building regulations and its compliance in law and procedure is not every professionals cup of tea. It requires constant interactions and knowledge of changes in procedure and instructions issued through circulars. The statutory approvals today requires applications to various authorities since many laws and regulations simultaneously apply to any development which was not the case before few decades. The professional institutions never imagined the no. of applications and N.O.C. to be obtained and merely kept 5% of the total professional fees for attending to the statutory approval.

Before we go in to details of Liability it would be advisable to understand few legal concepts.

"A crime is an offence against the state, which represents the public, and which will indicate its interest by punishing the offender. A criminal prosecution is not concerned with repairing an injury which may have been caused to an individual, but with exacting a penalty in order to protest society as whole by deterrence.

Liability in tort, on the other hand, exist primarily to compensate the person injured by compelling the wrong does to pay for the damage caused. A principal concern of the law of torts is with casualties of accidental i.e. unintentional, norm or loss. In this wider field, the law is concerned chiefly with distributing the losses which are an inevitable by-product of modern living. However, in allocating liability, it generally makes no allowance for punishment, admonition or deterrence but has capacity to do so in appropriate cases by awarding punitive or exemplary damages, although these cases are comparatively rare.

The law of contract exists, at least primarily, for purpose of enforcing promises made by one party to another. It does this, where contractual promises are breached, generally by awarding damage to the promisee. The object of an award of damages is to place the promisee in as good a position as if the promise had been kept. In some circumstances the court can compell the promiser to perform the promise rather than award damages.

Finally, liability in the emerging area of law known as restitution is based primarily on the idea that Justice require restitution for unintended benefits so as to prevent unjustified enrichment of one party at the expense of another. Unlike the law of contract it has nothing to do with promises and unlike the law of torts, it has nothing to do with compensation for losses.

The practice of a profession, art or calling carries with it a legal duty to exercise to a reasonable extent, the skill, ability and experience which it demands. Such a duty is not only owed in contract to the party who enters into a contract to retain the professional. It is also owed in tort to "Proximate" third parties, where a contract exist between the parties they may agree to limit the liability which arises between them in either tort or for breach of contract. However, liability to third parties with whom the contract exist can not be effectively limited.

An Architect may become liable in either contract or in tort for the physical injury or damage or economic loss which a person has suffered due to his failure to possess or exercise reasonable skill and care in the performance of the professional work.

In very general term a tort is a civil wrong, other than breach of contract, which the law will redress by an award of damages.

Before going into the statutes it will be advisable to enumerate different liabilities that arise in the Architectural Profession.

From Agency or Agent :

Architect is solely responsible for the act of his employee and any consultants appointed by him over and above the liability for his own work.

As Agency or Agent :

Architect is the technical agent of the client and as such he owns duty to care and exercise of reasonable skill, experience and knowledge while carrying out his professional work. He may be held liable by the statutoring authorities in event of his making mis-statement or mis-representation without due care and caution.

Negligence :

Negligence is the failure of a professional to use such care or skill as a prudent or reasonable professional would exercise in normal course of events.

For an act or omission of a professional to be considered negligent at law the following elements must exist :

a) a duty of care owed by the professional, to a specific person or class of persons, to exercise care or skill.

b) breach of that duty by failure to perform to the appropriate standards.

c) damage to the plaintiff arising from the breach of duty.

It should be noted that negligence does not require intent on the part of person who commits (or omits) the act. It is an act (or omission) which is itself, in the circumstances, negligent.

For Estimate :

It is better to use the words "Indication of cost" rather than word Estimate.

Estimates must give dates, basis of rates to the time frame and note that it will change as per inflation or change in design depended upon actual time of implementation.

In absence of which a professional is exposing himself to the allegations of mis-statements and may be held liable for the same.

For time over run :

Generally it is the contractors responsibility to execute the work within stipulated time. The power of extension of the stipulated time of completion vest with Architect which should be exercised with due care and caution restricting the extension of time due to force majure, unforeseen circumstances like non-availability of certain material or impediments arising due to site conditions or weather.

The general practice of not completing the drawings specially the working drawings before calling the tenders and awarding the contract is not proper. The issuance of drawings and instructions from time to time during the progress of work generally impedes the smooth progress of work. More than 90% of the claims preferred by the contractors arise out of non-supply of drawings or Architects instructions or instructions for extra items. An Architect will expose himself to the liability of damages if he fails to perform his duty in reasonable time by giving necessary and adequate drawings, instructions or decisions.

The present system of granting commencement certificate in parts by the authorities brings the progress of construction work to the grinding halt which must be looked into and redressed.

The delays caused by nominated special contractors and suppliers create a situation whereby general contractors and Architect become helpless observers ultimately client bears the burden of such eventualities.

Negligent Mis-statement :

This is one of the most important area in which the Architect should be very careful while expressing his opinion in writing or orally. There are court cases and judgements in other countries wherein contractors have sued the Architect for misguiding them that there are no difficulties on site and the envisage work on lumpsum basis can be completed in a particular cost.

Similarly clients can also take advantage of the Architect's statement that such as such work can be completed within at the most so much of cost. When cost increases the clients tend to blame it on Architects due to his poor communication methodology and general apathy of not keeping the question of increase in cost in writing.

It should be understood that Architect has no authority on his own to increase the cost of contract by variation or extra items without knowledge and concurrence of the client and agreement as to the rate by the contractor which leads to dispute and consequent legal actions.

The famous case of the supply of confidential information as to the financial position and liability of a contractor given by firm engaged in such investigation turned out to be wrong. Within six months of the award of contract, the contractor became insolvent, leading to successful legal actions against the firm for damages.

Similarly a professional even if not engaged in a project should refrain from expressing an opinion as to the cost or workmanship without going into details. This is also a negligent mis statement making him liable to misguide the person since he being professional can not make the comments lightly in a casual manner which goes against him. However if the client engages him to give second opinion and he does his duty to the reasonably care expressing his opinion he is not liable to any claim.

Conflict of Interest :

Almost all throughout the world in all countries the definition of profession is changing fast. In case of industrial projects consultants select even manufacturing system and machinery along with technical know-how and enter into the turnkey contracts giving indemnity for production in quantity and quality inclusive of erections, trial run and adequate method of demonstrating the capabilities along with training of personnel.

In case of Architectural practice the law as promugelated does not debar an Architect from doing any allied or connected work as long as there is no conflict of interest between him and client. Conflict of interest, if any, if disclosed to the client at initial or appropriate stage and client chooses to go ahead or continue the engagement may not be considered improper or unprofessional. However a certain set of circumstances may exist which may make his acceptance of the assignment in case of conflict of interest, unprofessional even with the concurrence of client.

In the contemporary times many professional can make two ends meet economically with difficulty without engaging himself in other economic activities. The presumption as held in case of Lawyers, Doctors and Chartered Accountants do depend solely on his professional practice, is arising out of statutory provisions that they alone can practice their profession or vocation. Such is not the case in matter of Architectural profession. However the other professions also they are entitled to become director in a Limited Company. All professional bodies throughout the world has accepted the plea and allowed Architects to practice their profession with wider horizon which inevitably brings about greater responsibilities and liabilities. This has yet to find place in some of the professional institutions in the country.

Liability to third party :

As explained earlier Architect is responsible to the proximate parties it includes subsequent owners, tenants, occupiers as well as passer by since it involves the question of safety.

Liability to the contractors :

Architect should provide all drawings, instructions and decision in time in order to maintain the progress of construction work as envisaged. It is incumbent on him to act impartially between client and contractor while administrating the building contract. He should be very specific and avoid making any mis-statement particularly during the negotiations and finalisation of building contract. There are cases wherein Architects are sued either by contractor or client for such liabilities.

Design Liabilities :

There is no statutory limitation of time frame for Design liabilities which can be classified broadly in to the following heads :

Fitness of purpose :

An Architect is duty bound to design the building or structure which will be fit for the purpose for which it is designed. Any deficiencies will make the designer liable for damages. There are many such cases and judgements giving details.

Statutes and Building Code Regulations :

Architect/Engineers are duty bound to design and advise the client to construct the building in compliance of prevalent statutes and codes. If not he may do it at his own peril.

Public and Private Rights :

Duty of care not to infringe with public or private rights such as easements, covenants of lease documents etc. is vesting in the Designer if not Design will be unimplementable.

Materials :

Designs in plans do not reflect the total ambience as envisaged by the Designer. He should be careful while introducing new materials or methodology which may give rise to liabilities.

Novel and Risky Design :

Unless sure and capable of evaluating the Novel and Risky designs as to its performance, suitability and durability Designer should not indulge into same.

Delegation of Design Duties :

Generally given to his own employee a designer without proper supervision or wetting of design process lend into problem.

Designs by Consultant engaged by clients and nominated specialised contractors or supplier:

It would be in the interest of Architect to adequately clear his role as to his scope of services weather it is for merely incorporating the requirement of other consultant in the design or is the Architect is supposed to scrutinise, wet and approve the design. In case of approval extent of his role and liability be clarified.

Statutory Responsibilities :

The Architect Act 1972 :

No person irrespective of his qualification call and style himself as an Architect unless he is Registered by the Council of Architecture constituted under the Act. The Registration requires annual renewal which can be done for number of years at a time.

The Council of Architecture has promugelated Architects (Professional Conduct) Regulations 1989 by following the procedure to keep the regulation on the table of Houses of Parliament. The Regulation so formed supersede all other laws and Architects are duty bound to follow the same.

The Regulations are detailed one. Since this subject will be discussed in the next session further details would be out of the place. The Council of Architecture along with All India Council of Technical Education is empowered to regulate the Architectural Education throughout India. The recognisation of course, its eligibility for Registration as well as detailed regulatory power in that behalf.

The Architects are duty bound to follow the Regulations of code of conduct any infringement if proved before the Council of Architecture is punishable by warning, Reprimand, short and long suspension of Registration as well total removal of name of Registered Architect for all time to come. The procedure and methodology of complains and its adjudication is prescribed in the Act. As long as Architect gets his registration renewed and act within the parameter of regulations there are no problems.

It is also to be noted that Architects are Registered with Council of Architecture. They are not the member of Council or Architecture and use of suffix M.C.A. is erroneous and misleading Architects are advised to refrain from doing so. Other professionals should not use the title "Architect" unless they are entitled to do so otherwise prosecution may be launched against them. The act in itself is promgulated for protecting the public from unauthorised persons calling themselves as Architect.

Building statutes, Regulations and codes :

Architects have to design their building in accordance with the prevalent Laws, Regulations and Codes. The no. of laws simultaneously affecting controlling and Regulating the development and constructions are many few of them are as follows :

State Acts :

Bombay Municipal Corporation Act, 1888.

Maharashtra Regional and Town Planning Act, 1966.

Bombay Metropolitan Regional Development Authority Act, 1976.

Maharashtra Housing and Area Development Act, 1981.

Maharashtra Land Revenue Code.

Maharashtra Water and Air Pollution Act.

The Bombay Hotels and Rent Control Act, 1948.

Co-operative Societies Act.

Ownership Flat Act.

Apartment Ownership Act.

Maharashtra Slum Improvement Act.

Maharashtra Vacant Land Act.

Maharashtra Industrial Area Development Act.

Central Acts :

Urban Land (Ceiling and Regulation) Act, 1976.

Transfer of Property Act.

The Indian Aircraft Act, 1934.

Highway Act.

Defence of India Act.

Indian Railway Act.

Indian Electricity Act.

Lift Act.

Factory Act.

Environment and Pollution Act - Notifications etc.

National Building Code.

National Housing Policy.

From above list it will be apparent that there is multiplicity of Acts and Authorities regulating the development. The discussion on the same being out of question, being vast. However important amongst them is local Laws Regulations controlling and Regulating the developments with which the Architects are

conversant and try to design the buildings within regulatory parameters which vary from city to city. The powers are granted to all local, state and central authorities for the purpose of Health, Safety and Planned Development.

In the process several liabilities as to use of proper materials and workmanship vests in Architect, he being the head of entire construction team, by virtue of his signing the supervision memo and issuing the completion certificate. The process as adopted is enormous and devoid of realities and as such the suggested procedure as contained in the "Code of conduct for Component Agencies of the building industries" published by P.E.A.T.A. may be adopted.

Another problem arises when the client against the advise of the Architect indulges in or continue with infringement of Regulations and conditions of Approvals, for which many times the Architects have to face the music. It is advisable to keep proper record and communication in an Architects office in order to prove that the professional has acted timely, diligently and properly.

Consumer Protection Act :

From all the narration hereinabove the rights responsibilities and liabilities of the professional will be evident. The Consumer Protection Act does not create any new rights but prescribe a summary procedure for the Redressal of consumers grievances against suppliers, of materials and services, which include the professional. Proper office records due care and caution as well as timely warning to concerned client and agency will go in long way to protect a professional to prove that he has acted with reasonable care, skill and diligence.

Students :

Professional responsibility arise in case of students

a) Working as an employee in an architectural practice

b) Private commissious while still studying.

In case of working as an employee he is shielded from direct liability due to employer's duty to supervice the work of student and employee. However the standard of care to the client will be required in such circumstances is to exeacise the ordinary care of a professional acrchitect even if still a student.

In case of accepting private commissioner two situatious are likely to arise :-

a) The student holds himself or herself out as an architect

b) The student clearly indicates to the client that he or she is not a fully fledged professional.

In first case (a) it is a mis-representation the student will incurr liability as full fledge professional over and above the problem of mis-representation.

In second case (b) a duty of care exist but the standard of care will be that of the reasonably skilled student consumerate to the level of training acheived by the student.

Honorary Services :

Almost every architect acts in an honorary capacity in a Social setting sometimes. One should not presume that since the services are gratuitous there is no liability. He is an responsible to the extent of his services similar to that of other architect who is paid for such services.

An architect must excercise the standard of skill which is one in the profession and it is no defence against the claim of negligence even it the service provided were honarary.

Duties of An Architer as Employee :

Architect, be they self employed or employed, owe the same duties to there client in relation to professional standards. That is, the Architect's Specialist skill are to be applied equally whether employed or self employed. Any employee of the contracting architect firm can not be sued by the client for breach of contact being not party to the contract, but can be sued in tort for negligence.

An employee architect individually or with his firm can be sued in tort Since every qualified architect must do his work with care, caution, skill and reasonable precautions even as an employee. The professional responsibility of code of conduct, whether statutory or imposod by the membership of Professional institution apply equally to both employee and employer archiect.

Non contractual duty of care includes the following :

Errors in design, inadequate examination of site and works, misleading estimate, errors in bills of quantities, non complience with legislation, regulations and codes of practice, failure to administer building contract properly, inadequate supervision etc. All these liabilitity will arise over and above his contractual responsibility with employer architect.

Professional Idemnity Insurance :

It is an indemnity Insurance designed to protect the professional person from financial consequences resulting from legal liability for breach of professional duty.

This has been the solution against all the professional liability arising out of error, negleqence, accidents, employees error etc. in almost all the western countries. 10 to 15% of the professional fees goes to wards the payment of premium.

There are number of covers and types of insurances available. However in our country this type of insurance have just started before a couple of years. In time to come every professional will have to take out the insurance in order to provide for unforeseen damages inflicted upon him.

All this covers if taken out properly takes care of most of the civil liabilities of a professional. There can be no cover against criminal liability in case of accidents resulting into loss of life. The professional also must take care in his everyday practice to minimise ad-hoc approach to work, even if the insurance policy is taken out. Otherwise he may lend up paying higher and higher premiums since any small building accident or collapse will give rise to not lass than Rs. 50 lakhs claim.

It is necessary to think in terms of group insurance for small practioners in order to reduce the burden of premium. This type of insurances are in infant stage in our country which require understanding exposure and analysis by all professional institutions.

SESSION IV

CODE OF CONDUCT, EMERGING SCENARIO - PROFESSIONAL, DESIGN, OFFICE MANAGEMENT, ASSOCIATE, STAFF RESPONSIBILITIES

PANELISTS

SHRI KIRTY DAVE
SHRI R. N. RAIKAR
SHRI PREMNATH
SHRI RUMY SHROFF
SHRI R. K. DEOLE

TECHNICAL SESSION IV

Code & Professional Conduct

Almost since the world war II we have witnessed tremendous social, economical and physical changes warranting emergence of new professional approaches which is discussed in full length through the technical session IV. This is followed by technical session II enlisting component allied agencies besides statutes, authorities environment and what not? We have then examined the liabilities due to several enactments, regulatory and social. We now enter the technical session I which deals with code of conduct emerging professional scenario. Design and office management Associate / staff responsibilities.

Architects (Professional conduct)

The profession of architecture calls for men of integrity, business capacity and artistic ability. The architect is entrusted with financial undertakings in which his honesty of purpose must be above suspicion. He acts as a professional advisor to his client and his advice must be absolutely disinterested; he is charged with the exercise of judicial functions as between client and contractor and must act with entire impartiality. He has moral responsibility to his profession, associates and sub-ordinates.

It is pertinent to note that in addition to his obligations to the client, the architect has obligations to the public and to related professionals. Architects attention is also invited to the guidelines for Architectural Competitions which must be complied with and the architects are advised not to accept membership of the Jury or take part in a competition which is not in accordance with the guidelines formulated by the Council of Architecture.

Professional service is essentially a personal one, but the comprehensive responsibilities are often fulfilled in cooperation with members of other professions. It is the architects' function to advise on the need for other professionals and he is responsible for the direction and integration of their work with that of his own.

It is interesting to compare the code of conduct by Indian Institute of Architects and the one by the Council of Architecture.

CODE OF PROFESSIONAL CONDUCT

A Member or Student of the Indian Institute of Architects is governed by the Constitution and Bye-laws of the Indian Institute of Architects. The following clauses indicate the general standard of conduct to which Members and Students of the Indian Institute of Architects, whether enumerated by fee or salary, must adhere, failing which the Council may judge a Member or Student guilty of unprofessional conduct, and either reprimand, suspend or expel him or her. Cases of unprofessional conduct not specially covered by these clauses are dealt with by the Council having regard to the particular circumstances of the case.

1. A Member or Student must not hold, assume or consciously accept a position in which his interest is in conflict with his professional duty.

2. A Member or Student is remunerated solely by his professional fees payable by his client or by a salary payable by his employer. He is debarred from any other source of remuneration in connection with the works and duties entrusted to him. It is the duty of a Member or Student to uphold and apply the Scale of Professional Fees and Charges adopted by the Indian Institute of Architects.

3. A Member or Student must not accept any work which involves the giving or receiving of discounts or commissions, nor must be accept any thing which amounts to discount, or commission from contractors or tradesmen, whether employed upon his works or not.

4 (a). A Member or Student may be architectural consultant, adviser or assistant to building contractors, decorators, manufacturers, house and estate agents, development firms or companies, or firms or companies trading in materials sued in or whose activities are otherwise connected with the building industry, provided that he is paid by fee, salary or royalty and not by commission on sale or profits, and provided that he does not either directly or indirectly solicit orders for the firm or company.

4 (b). Where a Member is engaged specifically as an architectural consultant or adviser, as described in Clause 4 (a) his name and affix may appear only on the note-paper of the firm or company used in connection with his professional services.

4 (c). Where a Member or Student is engaged as an architectural consultant, advisor or assistant as described in Clause (4) (a), he shall not act in a professional capacity for a third party to whom his principals owe a contractual duty, but if mutually agreed between all the parties he may act as an independent architect on the direct instructions of the said third party provided that he receives the payment of fees direct.

5 (a). A Member or Student may be a partner, director or member of any company (except such companies as specified in Clause 5 (b), including a building society registered under any act of the Indian Legislature that may be in force; but his professional affix may not appear on the note-paper of the company.

5 (b). A Member or Student must not be a partner, director or member of a film or company carrying on business as auctioneers or house and estate agents or trading in materials used in or whose activities are otherwise connected with the building industry or trading in land or building for profit.

5 (c). A Member or Student must not carry on or act as principal, partner or manager of any firm, carry on any of the trades or business specified in Clause 5 (b).

6 (a). advertisements, respecting professional appointments open or wanted may be inserted in the Press provided they are directed only to members of the profession.

6 (b). one notice of change of address may be inserted preferably in the architectural professional

Press; in no case it should be done in a conspicuous manner.

6 (c). A Member or Student may notify his correspondents by the post once of any change of address.

7 A Member or Student may allow signed illustration and descriptions of his work to be published in the Press, but he shall not :

7 (a). give monetary considerations for such insertions;

7 (b). allow such insertions to be used by the publisher for extorting advertisements for contributors.

8 A Member or Student may consent to the publication of a series or illustrations either in circular, brochure or book from with or without descriptive letterness, of any building or buildings, for which he has been responsible, provided that :

8 (a). Clause 7 (b) of the Code is complied with, and

8 (b). there is no attempt to distribute the publication to potential clients.

9. A Member or Student may sign his buildings and may exhibit his name outside his office and on buildings in the course of construction, alteration or extension, provided that it is done in an unostentatious manner and the lettering does not exceed 5 cm. in height.

10. A Member or Student must not attempt to supplant another architect, nor must be compete with another architect by means of a reduction of fees or by other inducements.

11. A Member or Student on being approached or instructed, to proceed with professional work upon which another architect was previously employed, shall notify the fact to such architect before finally accepting the appointment.

12. A Member or Student employed as a full-time salaried and official architect by a central or local government department or by a statutory undertaking and who is by reason of his office in a position to grant or influence the granting of any form of statutory or their approval, must not under take private work notwithstanding any permission from his employing authority to do so, unless he is satisfied that his position and action in the matter will be free from any suspicion or suggestion of abuse.

13. In all cases of dispute between building owner and contractor a Member or Student must act in an impartial manner. He must interpret the conditions of a contract with entire fairness as between the building owner and the contractor.

14. A Member or Student must not permit the insertion of any clause in tenders, bills of quantities or other contract-documents which provides for payment to be made to him by the contractor whatever may be the consideration, unless with full knowledge and approval of the employer.

15. It is desirable that in cases where a ember or Student takes out the quantities for his

buildings he should be paid directly by the employer and not through the contractor except with the previous consent of the employer.

16. A Member or Student should not take any part in an architectural competition including the appointment as an assessor as to which the preliminary warning of the Indian Institute of Architects has been issued, and must not take part in a competition as to which the Council of Indian Institute of Architects shall have declared by a Resolution published in the Journal of the Indian Institute of Architects or issued a cricular that Members or Student must not take part because the conditions are not in accordance with the published Regulations of the Indian Institute of Architects for Architectural competitions, nor must he be associated in any way with carrying out of a design selected as the result of a competition as to which the Council shall have declared by a Resolution published in the Journal or issued a circular that Members and Students must not take part.

Members of Students asked to take part in a limited competition must at once notify the Jt. Hon. Secretaries of the Indian Institute of Architects submitting particulars of the competition.

17. A Member or Student must not act as architect or joint architect for a work which is or has been the subject of a competition in which he is or has been engaged as Assessor.

An assessor must not act as consulting architect, unless he has been appointed as such before the inception of the competition, not in any other professional capacity in any matter connected with the work which has been the subject of the competition, provided always that he may act as arbitrator in any dispute between the promoters and the selected architect.

If a Member or Student is officially approached by the promoters for advice as to the holding of a competition with a view to his acting as Assessor, and eventually it is decided not to hold competition but to appoint an architect to carry out the work the Member or Student originally approached a advisory capacity is precluded from acting as architect for the work in question.

Architects (Professional Conduct)

In exercise of the powers conferred by subsection (1) read with clause (i) of subsection (2) of Section 45 of the Architects Act, 1972 (Act No. 20 of 1972), the Council of Architecture, with the approval of the Central Government, hereby makes the following regulations to promote the standard of professional conduct / self - discipline required of an architect namely :

1. Short Title and Commencement :

   (1) These regulations may be called the Architects (Professional Conduct) Regulations, 1989.

   (2) They shall come into force on the date of their publication in the Official Gazette*

2. (1) Without prejudice to the provisions of the Central Civil Services (Conduct) Rules, 1964 or any other similar rules applicable to an architect, such architect shall.

   (i) ensure that his professional activities do not conflict with his general responsibility to

contribute to the quality of the environment and future welfare of society.

(ii) apply his skill to the creative, responsible and economic development of his country.

(iii) provide professional services of a high standard, to the best of his ability.

(iv) if in private practice, inform his client of the conditions of engagement and scale of charges and agree that these conditions shall be the basis of his appointment.

(v) not subcommission to another architect or architects the work for which he has been commissioned without prior agreement of his client.

(vi) not give or take discounts, commissions, gifts or other inducements for the introduction of clients or of work.

(vii) act with fairness and impartiality when administering a building contract.

(viii) maintain a high standard of integrity.

(ix) promote the advancement of architecture, standards of architecural education, education, research, training and practice.

(x) conduct himself in a manner which is not derogatory to his professional character, nor likely to lesson the confidence of the public in the profession, nor bring architects into dispute,

(xi) compete fairly with other architects,

(xii) observe and uphold the Council's conditions of engagement and scale of charges.

(xiii) not supplant or attempt to supplant another architect,

(xiv) not prepare designs in competition with other architects for a client without payment or for a reduced fee (except in competition conducted in accordance with architectural competition guidelines approved by the Council),

(xv) not attempt obtain, offer to undertaken or accept a commission for which he knows another architect has been selected or employed until he has evidence that the selection, employment or agreement has been terminated and he has given the previous architect written notice that he is so doing :

provided that in the preliminary stages of works, the client may consult, in order to select the architect, as many architects as he wants,

provided he makes payment of charges to each of the architects so consulted;

(xvi) comply with Council's guidelines for architectural competitions and inform the Council of his appointment as assessor for an architectural competition.

(xvii) when working in other countries, observe the requirements of codes of conduct applicable to the place where his working.

(xviii) not have or take as partner in his firm any person who is disqualified for registration by reason of the fact that his name has been removed from the Register under Section 29 or 30 of the Architects Act, 1972.

(xix) provide their employees with suitable working environment, compensate them fairly and facilitate their professional development,

(xx) recognize and respect the professional contribution of his employees,

(xxi) provide their associates with suitable working environment, compensate them fairly and facilitate their professional development,

(xxii) recognize and respect the professional contribution of his associates,

(xxiii) recognize and respect the professional contribution of his consultants,

(xxiv) enter into agreement with them defining their scope of work, responsibilities, functions, fees and mode of payment.

(xxv) shall not advertise his professional service nor shall he allow his name to be included in advertisement of to be used for publicity purposes save the following exceptions.

(a) a notice of change of address may be published on three occasions and correspondents may be informed by post,

(b) an architect may exhibit his name outside his office and on a building, either under construction or completed, for which he is or was an architect, provided the lettering does not exceed 10 cm. in height.

(c) advertisements including the name and address of an architect may be published in connection with calling of tenders, staff requirements and similar matters,

(d) may allow his name to be associated with illustrations and descriptions of his work in the press or other public media but he shall not give or accept any consideration for such appearances,

(e) may allow his name to appear in advertisements inserted in the press by suppliers or manufacturers of materials used in a building he has designed, provided his name is included in an unconstentatious manner and he does not accept any consideration for its use,

(f) may allow his name to appear in brochure prepared by clients for the purpose of advertising or promoting projects for which he has been commissioned.

(g) may produce or publish brochures, pamphlets describing his experience and capabilities for distribution to those potential clients whom he can identify by name and position,

(h) may allow his name to appear in the classified columns of the trade / professional directory and/or telephone directory.

(2) If an architect practices as a partner in partnership firm or is in-charge and is responsible to a company registered under the Companies Act, 1965 for the conduct of business of such company, he shall ensure that such partnership firm or the company, as the case may be, complies with the provisions of sub-regulation (1).

(3) Violation of any of the provisions of sub-regulation (1) shall constitute a professional misconduct.

Taking into consideration the prevailing situation we find there is sea change in the roll of Architect and in that perspective the code of conduct needs simplification through moral conduct, contract for scope of work and the fees to the services rendered.

It is interesting to have a glimpse of the world scenario as expressed in the article by Mr. Pactric Jevis.

ROLE OF ARCHITECT

A comparison between the roles played by the architect in Europe and America highlights the client's varying expectations of architects as co-ordinator and communicator with builder. A short assessment of each country's system could suggest desirable modification to the English codes of engagement.

In the UK there is a tradition of the architects as a craftsman component in all fields. The German architect has artistic and technical control but is not expected to supervise the work. Their American counterpart may not visit the site regularly but will still have a clear understanding and expectation of the application of interpretations. The extreme case of French architect who is divorced from the site and relies on the good offices of another for the faithful execution of his project.

In the UK and America general contracting is normal German official policy dicouraged the information of large national construction firms because of the lien of the individual right instead encouraged local single trade contractors, the only method that goes some way towards general contracting is to let for the building shell which is then finished by separate trade contractors in the usual way. The French do have general contracting but the old system of contracting by trade is still preferred.

The American designer provides the minimum of information and a full set of working drawings shows obvious difference from English practice. Individual sheets contain more information and they indicate only performance, specification, a minimum with which the contractor is expected to construct on the implicit understanding he should improve them using his specialist knowledge. Yet each drawing is a separate document for multimillion dollar building.

The standard contract in each country mirrors the clients expectation of his architect. The joint contract tribunal contract is largely let on the understanding that "It is all there", and that there is nothing further to do but supervise the erection, deal with the incidental administration and solve any

minor problem as the work progresses.

German contractor, because he is generally competent in one trade, expects co-ordination from a building leader who may be the Architect. This is let as a separate professional responsibility from the architects' general duty to ensure artistic and technical faithfulness of his concept.

American AIA document A-201 dates from 1888, and is recognised for its high quality. Because of long familiarity with the document, the construction industry give a general evenness of service, including standardization of components.

The French have evolved a different system, for although standard contract are in existence, they are rarely used. It is the contractor, who has to confirm' since 1945 the French contractors' association has centralised informations on building firms, where potential and the class of work for which they are competent. It makes this information available to third parties through the issue of certificate of competence, which assesses technical ability, personnel and financial resources.

PROFESSIONAL SERVICES :

The title architect is protected in some countries. Since the title is a monopoly, the client can expect minimum service yet this minimum varies considerably from country to country. In Germany the architect carries responsibility for managing the design and construction process to a greater extent than in the U.K. He is responsible for taking client's instructions, developing a design solution and cost plan, obtaining statutory consent, conforming with building and preparing contract documents, including bills of quantities. He co-ordinates the work of consultants and advises clients on contractual methods. When the contract documents are ready he submits a budget cost to the client and arranges for the initiation and letting of contracts.

Since there is no sharp distinction between architects and engineers, because of strong bias in training towards structural engineering, many architects are qualified to deal with structural design. However, the architect is relieved of his legal liability for structural design by the requirement that his or the structural engineer's statistical calculations and design be submitted approval by a third party who may be a local government official or a qualified engineer, licensed by the inspecting authorities.

The architect's responsibility is for the satisfactory design and execution of the works. his general liability is carried out for five years after settlement of the final account, unless criminal negligence is involved. Where an initial notification prior to the issue of a writ has been made in the form of a bill claiming liquidated damages, a period of upto two years may be allowed for the compilation of expert evidence. This may be further extended at the discretion of the court, if a detailed technical study requires more time. Under the German statute of limitation, time runs from final completion and not from the date the defect becomes apparent. The architect is not required in law to take out professional indemnity insurance although many do. In the US professional services are rigidly phased, schematic design development of the document to show appearance, structure, services, details, material and an outline specification, the final detailed construction documents, which are expected to comply

with all relevant codes and which will be followed by the contractor in building the project. The architect assists the client in obtaining bids of negotiating the selected contract, in evaluating proposals, and in awarding contract. He will also perform general administration of the construction contract, including period i.e. site visits to review progress and quality. Additional services, usually considered in the UK, would include economic feasibility analysis, detailed cost plan, and project programming. The architect is generally assumed to have professional liability insurance, or a bond for a specific project, although this is not compulsory. The architect as a general partner has unlimited liability and as in the UK is not liable for damage due to errors and omissions, which are not negligent. Although under an obligation to correct any defective design work, the architect will not be liable for the cost of correcting faults unless there is evidence of failure to use reasonable care, skill and judgment. Although contracts can be made under seal, with an extension of the period of liability, the state requirement to stamp drawings is only a mere showing of the legal status of the registered architect.

SCOPE OF CONTROL

The main difference between all the countries occurs when building begins. In the UK the architect is permitted to make changes or remedies unless they fundamentally alter the nature of contract. While this may be unwise in a lump sum contract, it indicates a degree of control not available to architects in the other countries.

The German architect is only permitted artistic direction which ensures that the appearance of the work is faithful to his intentions; and technical direction which is general administration but does not cover site supervision. If desired, this site supervision forms a separate contract which the architect can perform.

The American architect has authority only to order minor changes not involving an alteration to the contract sum or contract time. He has to hope that his intentions are being faithfully interpreted because his role is contractually reduced from supervisor to observer.

In France, the architects are debarred from the site as supervisor, and a bureu d'cludes or maitre of occure must be used.

CONCLUSIONS

The American system provides obvious benefit to the client in speed and economy. It has often been recommended that the design responsibility would be unfair for a UK company to bear. There is no ready comparison of levels of liability between a company an a individual the Sale of Goods Act 1979 covers supply of materials which must be of merchantable quality and reasonably fit for the purpose, whereas common law governs architect lability. The test there is an exercise of responsible care and skill. Since courts look unfavourably on exercise clauses, as does statute (Unfair Contract Terms Act 1977), it could be a reasonable imposition on the contractor and counter sign all guarantees. The client should be protected by performance and labour and material payment bond against the failure of this legal relationship.

In turn the architect and principal consultants should be bound with clear division of liabilities and there should be attendant bonds to protect the client. Extent of liability is at present being reviewed by a Royal Commission and, while the test of reasonable skill and care is not onerour, period of limitation may be desirable. Finally as protect for the contractor, the client should take a surety bond for the construction costs.

The changes would retain the traditional links between patron, architect and builder. The patron would play his own part in the building of his future home and the architect although his unpartiality in arbitrations important to retain would then be more his adviser than agent contractor more initiative in the solution of technical problems. On site he should not impose his will dictatorially, but value his craftsmen's abilities.

COMPUTERISATION - AND IT'S IMPACT ON THE ARCHITECTURAL PROFESSION

The recent visit of Mr. Bill Gates to India has generated a fresh wave of interest and enthusiasm in "Information Technology" products such as personal computers and more particularly Internet.

Information Technology has already made a substantial impact on business and industries and Architectural Profession is no exception.

The day has almost arrived when we can easily conduct business, undertake study, explore the world and its cultures and call up great and varied entertainment without leaving our desks or arm-chairs.

A great deal of our work now involves knowledge and decision-making, so "Information" has become the focus of a new way of life and the conduct of business.

Computerisation not only offers convenience and saves labour but it can also inspire us to new creative heights. It assumes a trusted place besides our other conventional tools. A new generation grows up with it, changing and humanising it. It is now quite clear that computers improve the effeciency and accuracy of even the most talented practitioners.

With the advent of the global interactive network our work culture will be transformed dramatically. Personal computers have already changed our work habits, but the evolving Internet will change our lives. We will be able to stay in touch with anyone, anywhere and have access to unlimited sources of information virtually at our fingertips.

Collaboration and co-ordination among various agencies involved with the building process shall become not only convenient but accurate and efficient. It also facilitates collaboration on a golbal scale. Existing practices, in order to remain at the cutting edge of technology and progress in our field will have no option but to link up with such a global network.

Innovation is the key to survival. No practisioner can rest on its laurels because there is always a competitor coming up from behind. Unless we innvoate and start adjusting to the new tools available to us we will lose out.

DOCUMENTATION STORAGE AND RETRIEVAL : When we think of a document, we probably visualise one or more pieces of paper with print on them. Paper will be with us for the forseable future but its importance as a medium for providing, preserving and distributing information is already deminishgin. Because all kinds of information by way or print, graphics video and audio can be stored in digital form (floppies).

Documents containing such information will get easier to find, store and distribute. Digital documents can also be faster to work with than paper documents. Information can be transmitted instantly and retrieved almost as quickly. It is simpler and quicker to search through and easy to restructure its

content. Besides digital storage has become fantastically inexpensive.

VIRTUAL REALITY : New technologies offer us new means with which to express ourselves. We are able to simulate aspects of reality through appropriate soft-ware packages currently available. It enables us to picturize the conceptual scenario in a way never before possible, thereby minimizing the risks of costly failures.

BUSINESS PRACTICES : Over the next decade business worlwide will be transformed. These changes will allow companies / practices to be more effective and perhaps even smaller. In the long run, many businesses will decentralize and disperse their activities and cities may be downsized too.

Businesses welcome information technology because long term success in business depends on improving quality and productivity. Network connections and a greater use of electronic documents provide facilities such as video-conferencing, e-mail, flexible ways of viewing data and easier collaboration among staff, supliers and clients / customers world wide. Even the smallest practices can share in the commercial advantages of information technology. While practices of all sizes benefit from computerization, small practices are perhaps the greatest beneficiary. Low-cost hardware and software allow even a tiny outfit to compete effectively in its area of focus with large multi-national corporations. Thanks to the personal computer, a small practice can compete more effectively with the big players than at any time in the past. Even the smallest player has been empowered by the personal computer. One person, without any staff can produce drawings, reports, documents, handle correspondence, bill clients and maintain a credible business presence.

However, computerisation by itself is not a panacea. A personal computer or a network of computers is just a tool to help solve identified problems. It is not, as some people sometimes seem to expect it to be - a cure-all. The first principle for any technology introduced into a business or practice is that, automation applied to an effecient operation will magnify the effeciency. The second is that automation applied to an ineffecient operation will jut entrench the ineffeciency.

PROFESSIONAL MANAGEMENT

The managers of a consulting engineering business are managers of a people business. People are the producers of the end product, and the quality of the product is dependent on the technical skills, imagination and ingenuity of the people who produce the product.

The managers must understand the people who are working for the firm : their goal and objectives and the things that motivate them to perform in a superior manner. The goals and objectives of the firm must be consistent with the personal goals and objectives of the people within the firm. Managers must make short - medium and long range plans for the firm and they must provide the staffing for projects and decide if the overall staff is sufficient for future work. In addition, managers must establish systems of controls to evaluate progress being made toward achieving the firm's goals and objectives, and systems to determine if individual projects are being performed on schedule and within budget. Thus management has the functions of planning, organizing, directing, staffing and controlling for the firm as a whole and for the projects performed by the firm. Management also has the responsibility for marketing the firm's services.

In regard to personnel, management has the responsibilities to provide (1). a working environment that is satisfying to the people involved (2) the leadership to develop people's confidence that their careers in the firm will be rewarding, (3) the incentives to motivate people to perform to the best of their abilities and (4) a reasonable profit so the firm and the people in it can survive and prosper.

OFFICE MANAGEMENT IN ARCHITECTURAL PRACTICE

This begs the question of how an architectural practice can meet sometimes conflicting business and professional demands.

Because it is a profession, the practice of architectural must hold to high standards of service to its clients and the general public. Professional registration laws place a heavy burden on those who practice, requiring that they certify that their work is consistent with the public health, safety and welfare.

Architectural deal in professional services, applying the time and talent of their professional services, applying the time and talent of their professional, technical and support staff members to solving client problems and meeting clients and public needs. such personal and professional services cannot be neatly defined and specified. Not infrequently, the professional discipline and public interest, even though the economic burden of this effort falls heavily upon the firm. The firm will son lose any semblance of professional reputation if it shortcuts service to the client because the budget of the engagement has been expanded or if it fails to consider the public impact of the work even though the fee is not sufficient.

Conversely, an architectural firm will not be viable if it neglects sound business practices. It must

negotiate and collect fees for its services which cover all costs of doing business and provide a fair return on the capital invested. Only a profitable practice can remain in business long and, therefore, be in a position to practice professionally. But excessive emphasis on financial results will inevitably chill the firm's commitment to professional excellence and service to clients and the public. The need for a firm to chart a course that satisfies both business and professional responsibilities is clear. The method is not. While statements of principle and objective are important (and every architectural firm should have them), the real working out of professional and business responsibilities is done in the day to day actions and decisions of the principals and staff members. Hence, a key to achieving a successful balance between business and professional demands lies in having the ownership control and management of the firm in the hands of design professionals who are sensitive to sound business practices. Architectural firms have failed because their architect principals were not sufficiently committed to sound business practices. Others have failed because their non architect owners and managers placed too much emphasis on financial results and neglected professional responsibilities. It is for this reasons that Americans has consistently emphasized the importance of independent professional ownership and control.

NEED FOR CHANGE

There are lots of changes in Architectural/Engineering practices. Drawings are prepared line by line with pencil but the use of photo reproduction is increasing. Specifications are produced by high speed type writers or computers from "master", duplication of specifications and drawings is by machines. `Scissors drafting' is a method of using microfilm. Original drawing is cut up or parts blocked out, a microfilm is made, full size negative is made and from this a contact print is made. Parts of drawing are photographically printed full size. These methods are useful when multiple full size or reduced size plans are needed in multistorey buildings housing projects where repeated details are used.

Each new construction technique should be familiar to the Architecture/Engineer or his consultant before it is used. The production of construction documents by the A/E may have to be revised to provide opportunities for some of these new operations. Even the equipment used for construction may influence the design or details of a project. Powder-activated tools, staplers, spray equipment, hoists and cranes of various forms, and many other tools dictate, to some extent the details and to a great extent the field application of many materials. It's a constant education to keep in step but one which is necessary if the A/E is to design functionally economical projects.

Project management is basically the handling of the entire project, often from purchase of the land to completion of the construction. There are many specialists involved and at present most of these are provided by separate consultants or other employed firms. The future of this business needs investigation and considerable change in A/E operations. Very few A/E's at present are really qualified to take on a project management consignment. In order to make this a profitable venture, education of architects or engineers needs very much revision including a great deal more business-type courses. Present experience of younger persons during their internship also needs revision. Unless an office is presently organized for successful project management, a person working in that office will have little opportunity to acquire any knowledge or skill in that direction. As the field grows the professional organization will be forced to provide supplementary education for existing A/E's and colleges will have to provide evening classes with this in mind. Not all A/E's will be interested in project management as it will probably take a considerable staff to do a proper job of it, but it offers a challenge for those who are interested.

Until the last few years the owner and the A/E usually considered only the cost of construction, land a few related items. Maintenance of the project until it became excessive, or until the building become obsolete, rarely entered the picture. This is however very important to the owner. A/E's are now being asked more and more to consider these aspects of any project and this again requires expertise. A good knowledge of land costs, construction costs, financial return, maintenance costs, and ultimate sale or demolition is necessary. If these requirements are coupled with project management the problem may not be a great, but again most A/E's are not organized for project management at present. Education and experience are required but the office may not have to be so large.

All nations are now interested in the possibilities of solar energy, the ultimate use of undersea areas, nuclear energy, conversion of waste in its many forms, even interplanet usage. Here again present

A/E's have had little education and practically no experience in handling any of these projects. Environmental controls are not a new thing but one that is taking on more importance for the A/E daily. Almost every project now requires consideration of the effect of construction on the surroundings.

SUMMARY

Progress does not stop. The A/E is in a particularly interesting position in the construction industry to take advantage of the many new or future roles that will affect this industry. Gaining the new knowledge may not be easy in some cases, but in order to be successful, or even up-to-date, the A/E must know and thoroughly consider the new methods. Some of the new things may simply require a bit of adjustment in the office or may entail a considerable overhaul. In the very near future educational institutions, professional societies, and even the owner-public must review new systems and change their attitudes towards them.

It is Interesting to Study the provisions of the

ARCHITECTS REGISTRATION BOARD (ENGLAND)

CODE OF PROFESSIONAL CONDUCT AND PRACTICE

INTRODUCTION

Architects are subject to the disciplinary supervision of the Board. In particular, a disciplinary order may be made against an architect if the Professional Conduct Committee is satisfied that he is guilty of:

- unacceptable professional conduct; or
- serious professional incompetence
- or has a criminal conviction

1. Unacceptable Professional Conduct

'Unacceptable professional conduct' is conduct which falls short of the standard required of a registered person.

1) The Code issued by the Architects Registration Board in accordance with the Architects Registration Act 1931, section 7AE, as inserted by the Housing Grants, Construction and Regeneration Act 1996. This section reads:

(1) The Board shall issue a Code laying down standards of professional conduct and practice expected of registered persons.

(2) The Board shall keep the Code under review and vary its provisions whenever it considers it appropriate to do so.

(3) Before issuing or varying the Code the Board shall:

a) consult such professional bodies and such other persons with an interest in architecture as it considers appropriate; and

b) publish in such manner as it considers appropriate notice that it proposes to issue or vary the Code stating where copies of the proposals can be obtained:

(4) Failure by a registered person to comply with the provisions of the Code:

a) shall not be taken of itself to constitute unacceptable conduct or professional incompetence on his part; but

b) shall be taken into account in any proceedings against him under section 7 (disciplinary proceedings).

2. Serious Professional Incompetence

'Serious professional incompetence' by an architect is conduct or an action connected with his profession representing a serious falling short from the standards of practice required of architects, whether in the form of a single or a repeated act or omission.

The successful bringing of civil proceedings against an architect does not automatically constitute grounds for disciplinary proceedings. However, the facts giving rise to a civil suit can result in disciplinary proceedings, for example if they disclose serious professional incompetence or a wilful disregard of the architect's contractual obligations.

3. Criminal Convictions

A disciplinary order may also be made if an architect has been convicted of a criminal offence other than an offence which has no material relevance to his fitness to practise as an architect.

A criminal conviction shall be materially relevant to an architect's fitness to practise, if, for example:

- it constitutes an offence under the Architects Act 1931 or other legislation directly affecting architects; or
- it arises directly out of his professional activities; or
- it results in a sentence of imprisonment, whether suspended or not; or
- it constitutes an offence of dishonesty; or
- it is otherwise of a nature which brings into question the architect's integrity.

(This list may not be exhaustive of the offences materially relevant to an architect's fitness to practise.)

If it is alleged that an architect has committed a criminal offence the courts are the appropriate forum for deciding guilt or innocence and such an allegation will not, of itself, normally be the subject of investigation by the Board.

The fact that an architect has been acquitted in the courts of a criminal charge does not mean that he may not be disciplined for acts or omissions connected with that charge if those acts or omissions constitute unacceptable professional conduct.

Disobedience to an order of a court, though not constituting a criminal conviction, may nevertheless amount to unacceptable professional conduct if it concerns the architect's professional activities.

4. The Status of the Code

This Code lays down standards of professional conduct and practice expected of architects as registered persons. Mere non-compliance with a provision in the Code does not automatically give rise to grounds for disciplinary proceedings, but a failure to follow its guidance will be taken into account should it be necessary to examine the conduct of a registered person. The Code has not been drafted in legal terms and is not intended to be construed like an Act of Parliament.

3.3 An arch[illegible] the Code

[illegible]se of conduct is not expressly condemned in the Code does not mean that it cannot [illegible] of disciplinary proceedings. Architects are expected to be guided in their professional conduc[illegible] much by the spirit of the Code as by its precise terms.

6. The Limits of the Code

Not every shortcoming on the part of an architect will necessarily give rise to disciplinary proceedings.

First, disciplinary proceedings can only be brought in respect of the unacceptable professional conduct or serious professional incompetence of architects. Their private lives cannot be the subject of disciplinary action unless it affects their professional work or unless it results in a conviction for an offence.

Secondly, a minor transgression of the Code is unlikely to give rise to disciplinary proceedings unless it forms part of a pattern of unacceptable professional conduct or professional incompetence.

Further Information and Advice

An architect in doubt as to how he should act in a particular situation may seek information from the Registrar.

The fact that an architect has previously consulted one of the professional bodies of architects the Registrar or, if the problem has a legal dimension, a lawyer and acted upon their clear advice, may be of assistance to him in mitigation should his conduct subsequently be called into question.

Leaflets are available on application from the Registrar concerning:

- advise on complaint handling
- the disciplinary process of the Board

PRINCIPLES

The Code comprises Principles which are of universal application and which are amplified by the Standard which should be read in conjunction with the introduction and the Principles.

Principle 1 - Competence

An architect shall faithfully carry out his duties, applying his knowledge and experience with efficiency and loyalty towards his client or employer and being mindful of the interests of those who may be expected to use or enjoy the product of his work.

Principle 2 - Integrity

An architect shall at all times avoid any action or situation which is likely to raise doubts about his integrity.

Principal - 3 Others

An architect shall be every circumstance conduct himself in a manner which respects the legitimate rights and interests of others.

These Principles are amplified by the following Statements which are illustrated by Notes.

The Standards

Standard 1: An architect should not agree to undertake professional services for which he is unable to provide sufficient professional, financial or technical competence or resources.

1.1. Where work is carried out on behalf of an architect by an employee or by anyone else acting under an architect's direct control the architect is responsible for ensuring that that person is competent to perform the task and, if necessary, is adequately supervised.

1.2. Architects are required to observe the Code irrespective of their field of activity whether practising on their own account or as an employee regardless of their contract of employment or membership of any association.

1.3. An architect should ensure that his employer knows that he will be governed in his conduct by this Code in addition to his duties as an employee. If the two sets of obligations conflict the architect should in the last resort follow this Code or resign his employment.

1.4. An architect is expected to observe this Code wherever he is working except and only to the extent that to do so would be inconsistent with local law and practice.

Standard 2: An architect should not promote his services in an untruthful or misleading manner.

2.1 In advertising his services or otherwise drawing them to the attention of potential clients an architect should not make untruthful or misleading statements. The making of a claim that is incapable of objective justification always carries a risk that it may be misleading.

2.2. Advertisements should conform, as appropriate, to the British Code of Advertising Practice and the ITC and a Radio Cod of Advertising Standards and Practice.

2.3 The business style of a practice should not be misleading, for example by being confused with that of another practice.

2.4 An architect offering consultancy services and contracting services should make it clear to a potential client that his consultancy services are not independent of his contracting services.

Standard 3 : An architect should carry out his professional engagements faithfully and conscientiously and with due regard to any relevant technical and professional standards.

3.1 An architect should perform his professional work with due skill, care and diligence.

3.2 An architect should carry out his professional work without undue delay and, so far as it is within his powers, within any agreed time limit.

3.3 An architect should keep his client informed of the progress of work undertaken on his behalf and in particular of any delay or probable delay and of any occurrence or probable occurrence likely to increase the cost to the client.

Standard 4: An architect should manage his professional affairs responsibly.

4.1 An architect should not enter into an engagement unless the parties have clearly agreed its terms in writing, notably as to:

- the scope of the services
- the allocation of responsibilities
- any limitation of responsibilities
- the fee or method of calculating it; and
- any provisions for termination

4.2. An architect should not enter into or continue a professional relationship with a client if he, or his firm or any principal in his firm, has a business, financial or personal interest that is in conflict with an interest of his client. In a bordeline case the architect should make full disclosure of an interest and leave it to the client to judge. However, some conflicts of interest are so extreme as to prevent an architect entering into a professional engagement, even with the client's knowledge and consent. Particular care is needed with respect to the business and commercial interests of the architect's partners or co-directors, which in this context are to be treated as his own.

4.3. Where an architect has a professional relationship with two or more clients whose interests may be in conflict this fact should be made known to those concerned and wherever possible, the work of the firm should be managed so as to avoid the interests of one client adversely affecting another.

4.4. An architect should observe the confidentiality of his client's affairs and should not disclose confidential information without the prior consent of the client or other lawful authority, for example, when disclosure is required by order of a court.

4.5. At the end of a contract or otherwise on demand an architect should promptly return to a client any papers, plans or other property to which he is legally entitled.

4.6. An architect should ensure that his firm has:

- appropriate and effective internal procedures, including monitoring and review procedures; and
- sufficient suitably qualified and supervised staff;

such as to enable it to function efficiently.

4.7 An architect should not take as a partner and should not act as a co-director with an unsuitable person. Examples of unsuitable persons are:

- a person whose name has been removed from the Register of Architects otherwise than at his own request;
- a person disqualified from membership of a recognised body of architects.

4.8. A sole practitioner should have arrangements for the supervision of his practice in the event of his death or incapacity or other absence from work.

4.9. An architect should observe the law concerning discrimination on grounds of race, sex or marital status. A leaflet on this subject is available from: ???

Standard 5: An architect should preserve the security of monies entrusted to his care in the course of a professional engagement.

5.1. Where an architect has custody of monies belonging to a client or third party he should arrange for its receipt to be carefully recorded and for it to be kept in an account in a bank or similar institution separate from any account of the firm or of himself.

5.2. Such an account should be designated a 'client account' and the bank should be given written instructions that all money held in it is held as client's money and that the bank is not entitled to combine the account with any other account or to exercise any right of set-off or counter claim against it in respect of any sum owned to it by the firm.

5.3. Monies should not be paid out of a client account except with proper authority. In particular, the account should not, without the client's agreement, be used to defray the architect's fee.

Standard 6: An architect should have adequate Professional Indemnity Insurance cover when practising as a sole practitioner, partner or director of a company when undertaking an architectural commission within the UK, Channel Islands or Isle of Man.

6.1. This requirement applies to architects who undertake architectural commissions on a spare time basis while in other employment.

6.2 Architects, including those in public authorities, commercial or industrial organisations undertaking architectural commissions on a competitive basis? may satisfy this requirement by having equivalent indemnity provided by their employer.

Standard 7: An architect should ensure that his personal and professional finances are managed prudently.

7.1. Following acts concerning an architect may be investigated by the Professional Conduct Committee in order to discover whether they suggest unacceptable professional conduct:

- an order of bankruptcy or (if the architect is a principal of a firm) the placing of his firm into liquidation other voluntary liquidation for the purpose of amalgamation or reconstruction;

- an accommodation with creditors; and
- failure to pay a judgement debt.

7.2. Personal insolvency is an exception to the rule that an architects private life cannot give rise to disciplinary proceedings, since it may affect his professional solvency.

Standard 8: An architect should maintain his professional competence in areas relevant to his practice.

8.1. The facts that an architect has not maintained his professional competence may count against him in the event of his competence having to be investigated.

Standard 9: An architect should promote the Standards set out in this Code.

9.1 It is not enough that an architect orders his own professional life according to the Standards in this Code; he should also do what he can to ensure their observance generally by architects. For this reason an architect should report to the Registrar any serious falling short of these standards of which he is aware on the part of any architect. (It is not necessary to report facts that have been widely reported in the media.)

9.2. An architect should report to the Registrar without delay if he:

- is convicted of an indictable offence or sentenced to imprisonment in respect to any offence; or
- is made the subject of an order of a courts disqualifying him from acting as a company director; or
- becomes insolvent, either personally or professionally.

9.3. The fact that an architect has failed to make prompt report may count against him in the event of disciplinary proceedings.

9.4. An architect should not enter into a contract the terms of which would prevent any party from reporting to the Board the conduct of another? architect.

9.5. An architect is under a duty to co-operate with the Board in its conduct of investigations into the professional conduct or competence of architects, including themselves.

9.6. A failure by an architect to co-operate promptly and fully with the Board's investigations may result in adverse inferences being drawn against him in the event of disciplinary proceedings and in any consequential costs to the Board being reflected in the orders of the Professional Conduct Committee should he be found guilty.