PEATA

PRACTISING ENGINEERS ARCHITECTS AND TOWN PLANNERS' ASSOCIATION

DRAFT

CODE OF PRACTICE FOR COMPONENT AGENCIES OF BUILDING INDUSTRY

DRAFTING COMMITTEE

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PART I

EVALUATION OF EXISTING SYSTEM.

1.00 INTRODUCTION.

Entire gamut of Building constructions and development hitherto 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 and person responsible for maintenance was naturally interested in adequate quality in the proposed constructions. Due to this standard practice evolved envisage the constructions being done through contractors and architect acting with necessary 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 apointed under architect's controls paid seperately by owner, to continuously supervise the work of and to control erstwhile reputed contracting agency which invariably used to be there.

During last quarter of century particularly after 2nd World War, 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, which has lead to emergence of section of society interested in speculative profits specially in Urban Areas, where demand outstrip supply due to various causes. Investment is restricted to minimum bare necessary requirement of residential accommodation due to spiral of increasing cost. The class of developer known as "Builders" has emerged and building construction are being undertaken as a business for the sale of tenements on ownership basis. Builders having temporary interest in the property have resorted 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 due to several legislative and other lacunae.

Rapid urbanisation and industriallsation coupled with heavy demands has lead to slow & steady but definate detoriation in the quality of building materials supplied in market. Building material market most of the time remains sellers market and detoriaration in quality of supplied materials has contributed substantially towards detorioration 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 especially in case of cement and steel. Technical personnel cannot in spite of their best efforts, be expected to check minutely which is also not envisaged even during manufacturing process. Double pricing policy for cement adopted by Government needs reconsideration which gave rise to adulteration of such important input. Deterent punishment or policing may have temporary effect but is not a permanent solution. However, such consideration can not forms the part of code of practice and only attention of concerned authorities is drawn to the problem.

The entire document is divided in two parts. First part deals with evaluations of existing system. Second part deals with draft code of practice as recommended for enforcement by statutory provisions for different component agencies connected with development and building construction. The code is silent on two aspect. Firstly on the scale of professional charges and its payment as per stages and secondly on employment of partial services though impliedly provided there in. Draft code should be viewed as an attempt to specify and compile essential functions and requirementsneeded by statutory provision for successful development 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. Any one doing so may do it at his own peril but not at the peril of public safety. This being the under lying idea the reader is requested to peruse this document keeping above in view. As fare as possible present practice is supplemented by additional input keeping the main base of practice as it is. The professional charges, mode of payment and employment of partial services form the part of conditions of engagement of the professional which may be followed as per existing practice for the time being in force.

2.00 TRADITIONAL ROLE OF ARCHITECT

2.10 Traditionally the Architect has been considered as a principal technical agent of the client, assisting him in his constructions projects. 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 the 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 of 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 of materials and workmanship. The remuneration of the supervisor so appointed and popularly termed as "Clerk of Works" were borne by the client.

2.50 Scope of reference :

Depending upon the background and technical skills of the employers, and needs of the project the scope of architect's duties was defined and his remunerations were fixed accordingly.

2.60 Clients interest in the Work 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 construction work, had sincere and bonafide interest, being the ultimate owner himself. As such he also had to own all the liabilities of costs and consequences for early or heavy repairs and maintenance or 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.

Prescribed Code for Architects by Indian Institute of Architects :

The code of professional conduct, the conditions of engagement and scale of professional fees hitherto adopted are based on this system of working. Appended herewith is the standard code of professional conduct and conditions of engagement prescribed by the Indian Institute of Architects which is being followed for several decades (ANNEXTURE I).

2.80 Professional Code for Architects, Proposed by Council of Architecture :

This professional practice is also reflected in the "Architects (Professional conduct) Regulation 1982" and "The Architects (conditions of engagement and scale of charges) regulations 1982" as recommended by the Council of Architecture constituted under an Act of Parliament i.e. Architects Act 1972 (ANNEXURE II). This statutory Body is sole authority empowered to regulate the conduct of the Architects in our country.The fact that these rules are neither sanctioned nor rejected, nor has any modification been suggested by central government in last 3 years or so is ample testimony of the apethetic approach towards this vital issue, by this highest authority.

2.90 CURRENT Regulations under B.M.C. Licence :

Even the BMC Licence limits the scope of architects services thereunder to observe bye-laws and to see that A COMPETENT MISTRY IS ENGAGED TO SUPERVISE the execution of work and to ensure that no defective material is used therein. (ANNEXTURE III)

3.00 Effectiveness of these Codes of Practice :

3.10 General Working :

This system is still working satisfactorily where the development is done for a 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, Bunglows etc. The system works satisfactorily in such case both in private and public sector.

3.20 Practice in Government/Public Bodies & Departments :

All government departments, public bodies, state and central corporations who have distinct architectural departments for planning and design, also have cell/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 tht 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 the public authorities assign certain works to private architects 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 sevices for planning and designing only, limiting their "supervision" to the clarifications in case of doubt only. These illustrious public bodies 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 organistions with the architects appointed by them.

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 developers 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 construction. 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 sometime after the project is completed and premises are occupied by them. The ownership agreement is generally a one sided document and builders allow the buyers to occupy the tenements only after full discharge in respect of the Builders' obligations is issued by the purchasers. The problems of maintenance of the building including costs and consequences thereof become the responsibility of the purchasers and not that of builders.

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 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 prestegious aspects (like highrise)of the building have impact on sales. On both these counts only those having large capital can satisfy the prospective buyers. The tedious time-consuming procedures, heavy investments in premia, deposits and infrastructure and lastly the ULC Act have contributed to establish monopoly of affluent builders in this activity.

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 only the 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 contrctor is controlled and handled by the developer himself. All the materials required for 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 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 and by all imagination must also own all the shortcoming in overall construction/development.

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 progress of work. The sole contribution of most of developers in 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 these professionals this scope is made abundantly clear and professional fees are fixed for these limited services only.

4.80 Authority of Architect/Engineer in such construction :

The Architects and consulting structural engineers therefore hardly have any authority in 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 and methodology applied. It is common principal of administration and management that the responsibility and authority could go only together. There is also no statute which vests such powers in architects. It is not expected of builders that they would themselves vary the terms of references to the Architects or Consulting Structural Engineers 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 suuch situation in overall public interest by enacting suitable statute.

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 to day supervision agency by mandatory provisions. PEATA had several meetings with Municipal Authorities which is borne out by the enclosed copies of letters dated 10th June 1983. 21st June 1983 accompanied by an explanatory note describing the situation and recommended remedies. These efforts culminated in preparation of a final and detailed doucment which was submitted to Director (E.S. & P) on 7th June, 1985. (Annexure IV collectively).

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 system in the changed circumstances as detailed above. The first document in this regard was submitted as early as 1983 for consideration of MCGB being the local public authority in charge of public health and safetyy. 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 repeatedy pressed at several forums of seminars in may of which various officers of the MSCB were present.

5.30 Response from Authorities :

Our repeated meetings, submissions of various documents culminated in a seminar on "Lessons from failure of structures". One of the participants in this seminar 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 (ANNEXTURE V).

6.00 Failure of Structure :

In this background, whenever a structural distress 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.

In this conection a meeting was convened by the M.C. on the subject of "role of various agencies in private construction where the representatives of PEATA, Indian Institute of Architectes, Institution of Engineers (India) and Council of Architecture were present.

It is worwhile to note that representatives or other bodies which are national level organisations have endorsed our views and the document submitted by PEATA earlier was jointly endorsed and submitted personally to M.C. on 17th June, 1985. The outcome of our submission is still awaited.(Annexture VI)

Having become aware of this problem, PEATA has taken initiative in the matter and has been persistantly 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 legislations such as BMC Act or by enacting new statute to ensure proper control on constructions in Bombay to start with.

7.00 Need for Code of Practice :

It is thus obvious that the controls envisaged in earlier system have ceased to operate in changed situation. It is absolutely necessary to define the role of each of essential technical component agencies along with their functions, responsibilities and liabilities.

After great deal of deliberations with experienced senior members of PEATA alongwith eminent persons connected with the construction activities in this metropolis engaged in different deciplines of the same, a model document defining roles of various agencies is finalised and annexed. The practises and controls exercised in foreign countries, particularly in U.K. are also taken in account.

8.00 Effect of Code of Practice :

The proposed Code is evolved basically with an intention to provide fair deal to the owners, occuplers, 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 profesional constituents but would also make occupiers aware of their rights and responsibilities which is a best thing to happen.

9.00 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 redundent, incomprehensible, arbitrary rules,regulations, byelaws, circulars, policies and procedures which lack purpose or direction, solely created for arrogation of further powers, have degenerated into very long cumbersome and tedius 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 or others in the department and irrational, arbitrary 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 architects 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 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 dealys 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 aproval 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.

PART II

DRAFT

CODE OF PRACTICE FOR BUILDING INDUSTRY

10.00 Preamble

With the progress of science and technology the requirements connected with build ng activities are becoming complex as well as specialised. The construction activity being necessrily a team work of different deciplines it is essential and expedient to identify various components involved and define their respective spheres of activity interdependance and functions alongwith their respective rights responsibilities and liabilities.

10.10 Definitions :

In this code unless the context 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 professionals 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 essentialo 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 Superviser.
F. Contractor.
G. Occupier.

10.40 Description 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, licence or power of Attorney. Developer undertaking construction, development for sale as a buisness shall be a person duly liscensed by Statutory Authority to carry on such business.

B. **Architect/Engineer :**

B. **Architect/Engineer :**

Hereinafter referred to as Architect, is a person having requisite qualification and duly authorised by any law governing such profession including registration issued by Council of architecture or any other licence 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 construction such as Civil Enginee - ring 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 licence 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/unskiled labourers as required for due performance of his obligations as per the plans, design, specifications and instructions of the architect.

G. **Occupier :**

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

11.00 Functrions and Responsibilities of Component Agencies :

11.10 Developer :

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

b) Shall obtain all statutory permissions required for development in his name with the assistance of Architect and shall be responsible to fulfil and comply with all requirements, 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 an architect 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.

e) Shall appoint consulting structural engineers and other consultants in consultantation 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 site supervisor for constant supervision in consultation with Architect.

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

i) If the developer himself undertgakes the role of any any of the 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.

j) Shall possess requisite licence from 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 as per clause (i) to enable the Architect and other consultants to submit the acceptance completion in the form prescribed as per Annexure A.

l) 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 statutory requirements of registration of society and transfer of the property etc. Within 12 months from the date of completion of the project completely and on such formation provide the society with copy of all architectural drawings, structural drawings, service drgs. etc., as prepared by architect and consultants with the complete list of suppliers of different important components like lifts, air-conditioning plants, and fire fighting installation etc., and "DOS AND DONTS" prepared by Architects for the buildings in duplicate.

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

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

p) The conditions of engagement, scope of work and the responsibility of

the component agencies other than developer shall be governed by any written agreement between such agency and developer. The bonafide terms of agreement defining such conditions, scope of work and responsibility etc., which may be different and at variance than those in this code, shall supercede, over those in this code, whenever they are definately and explicitly entered into. In absence of any written agreement the provisions of this code shall prevail.

14.20 **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 devolved 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 only with the knowledge and consent of the Client.

d) The Architect shall give such periodic aceptance supervision and inspection as may be necessry to ensure that the works 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, except minor ones, on which a licenced site Supervisor 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.

14.21 **Liabilities of the Architect :**

The architect is liable if he 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 statged hereunder : -

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

documents 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.

11.22 Architectes Services :

(a) **Sketch Stage**

i) Take clients instructions regarding the requirements of the project as a whole.

ii) Acquaint the client with the conditions of engagments and scale of prfessional charges as may be applicable according to prevalent norms.

iii) Visit the site.

iv) Prepare in agreement with the client as programme of accommodation and requirements.

v) Examine legislation,code and standards as they affect the project.

vi) Prepare preliminary draft sketches and notes sufficient to explain the architects general understanding of the clients requirements and the outline of his plan for the best way of fulfilling them.

vii) Discuss the draft sketches with the Client and make such modification as may be necessary t satisfy the client that his requirements will be fulfilled.

(b) **Preliminary Stage**

i) Advise the client on the appointment of surveyors, consulting engineers and other consultants where necessary.

ii) Obtain from the client, or prepare at the client's expense a detailed topographical survey of the site to a scale and contour interval determined by the Architect inclusive of determination of its area and its statutory demarcation and may include all the necessry data related to the existing Public Utility Services lines of streets and pavements, building lines, adjoining properties, Rights, restrictions easements, party walls and boundaries.

iii) Assist in obtaining provisional approvals from Statutory Bodies local and other interested parties.

iv) Obtain from the client or prepare at client's expense test site borings, soil test, and such other tests required to provide essential design data from sub-soil conditions, tests shall be carried out as directed by the Architect or consulting engineers.

v) Prepare (with the assitance of consultants as necessary) a sketch scheme, report and estimate of cost, in sufficient detail to enable the architect to proceed with the working drawing stage of the proejct.

vi) Obtain cleint's aproval of the sketch scheme, report and estimate of

cost. Upon approval the architect's services in connection with the preliminary stage have been completed.

(c) **Working Drawings Stage**

Subject to the discretion of the Architect consummerate with the requirements of the project and his terms of reference and his engagementg and within framework of his responsibilities, the Architect shall

i) prepare working drawings giving enough information to enable a contractor to execute the work.

ii) have sole discretion as to the scale of the drawing, adoptation of standard details and supplementing the information by means of sketches and instructions in the site instruction book.

iii) Advise client and obtain approval on the form of contract and method of placing the main contract.

iv) Discuss with the client and obtain approval for the procedure to be adopted with nominated Sub-Contractors and nominated suppliers.

v) Discuss with the client and obtain approval for the procedure to be adopted in relation to imported materials and goods if required.

vi) Provide the surveyors, engineering consultants and other consultants with all the necessary information to allow them to perform their specialist work.

vii) Prepare the necessary drawings and documents and undertake the agreed procedure in relation to nominated sub-contractors and nominated suppliers.

viii) Prepare the necessary schedules and documents and undertake the agreed procedure in relation to all materials and goods.

ix) Direct and coordinate the architectural, Engineering and Surveying work, and prepare (with the help of surveyors, consulting engineers and other consultants as necessary) complete working drawings, schedules, specifications and bill of quantities (if required) to describe the whole project adequately for the purposes of placing the Main Contract by the the approved method.

x) Prepare (with the services of a quantity surveyors if necessary) the approved Form of Contract : assist to obtain approval of the Form of Contract from Government and Government Agencies when required.

xi) Obtain client's approval for any material deviation in design or cost or the working drawings, schedule and specifications from such approved scheme.

xii) Assist to obtain final approvals from statutory bodies and other interested parties. Upon finishing the working drawings, sufficient for starting the construction work in hand, schedules, specifications, schedule of quantities (if required) and Form of Contract, the Architect's services in connection with the working drawings stage have been completed.

d) **Construction Stage**

i) Conduct the approved method of placing the main contract on behalf

of the client (with the assistance of a quantity surveryor if necessary).

ii) Analyse and report on the rsults of the aproved method of placing the Main Contract, and make recommendations to the client to assit in the final selection of the Main Contractor (with the assitance of a quantity surveyor if necessary).

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 fulfil his obligations under the conditions of the contract.

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

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

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

e) **Supervision Stage**

i) Check and aprove 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 in general 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, if appointed, to provide constant superintendence to ensure that the work is carried out strictly in accordance with the working drawings and specifications.

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

v) Advise client if the total of authorised expenditure is likely to be exceeded.

vi) Advise client if the contract time is likely to be varied.

vii) Issue variation order onbehalf of the client on client's instructions or if changes are necessary for technical reasons.

viii) Check main contrctor's applications for payment (with the assitance of a quantity surveyor if necessry)./

ix) Prepare Interim valuations (with the assitance of a quantity surveyor if necessry).

x) Certify accounts.

f) At the end of the work building contractor or in his absence developer and site supervisor shall give completiion certificate in Prescribed Proforma (Annexure A) to consulting structural Engineer who relying on these certificates may give completion certificate and stability certificate or refuse the same in writing giving reaons 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 relying on these certificates 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 short-comings and remedial measures if any inclusive of reasons for its occurance 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) Structrual and full service completion drgs.
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.

11.30 Consulting Structural Engineer/Other Consultants

The scope, responsibility and liability of the consulting structural engineer and and other consultants shall be same as that of architects but only limited to specialised aspect of construction handled. All functions, responsibilities and liabilities as presecribed for the Architect shall apply mutatis - mutandis to the consulting structural engineers 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 of the discipline for which he has rendered the services.

11.40 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 over all control of Architect.

b) He shall exercise such powers, rights and responsibilities as may be assigned tohim 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.

(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 requirements 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 instructions 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 Architects and or other consultants as directed by the architect.

11.50 Contractor

(a) The duties, responsibilities and rights of the contractors shall be as per 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 contrct or shall submit to the Architect a certificate of satisfactory completion of work in the prescribed proforma (Annexure A) to an effect that all the materials used are as per 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 or its acceptance by architect shall not absolve the contractor from his liability to make good any defects, imperfections and shrinkages or 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 amended and made good by the contractor at his own cost. In case of default the part of the contrctor, 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, shrinkages 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 any 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.

11.60 Occupier

a) Shall use the premises diligently and for the purpose for which it is designed and intended.

b) Shall maintain the premises in proper condition and observe all the suggestion given in DOS & DONTS, 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, fittings etc., without due permission of and information to the architect, as amy 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 water-proofing is carried out and tested before refixing such tiles or fittings & fixtures.

12.00 Safety Code

A) Suitable scaffolds shall be provided for workmen 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 atleast 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 fromm the building or structure.

C) Working platform, gangways, and stairways 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 metres 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 in floor of a building or in a working platform shall be provided with suitable with suitable means to prevent fall of persons or materials by providing suitable fencing or railing with a minimum height of 1 metre.

Safe means 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 over 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 additionall 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 bear expenses of defence 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 metres or more in depth, shall at all times be supplied with atleast one ladder of each 30 meters in length or fraction thereof. Ladder shall be extended from bottom of trench to atleast 1 meter above surface of the ground. Sides of a trench which is 1.5 metres or more in depth shall be stepped back to give suital slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. Excavated material shall not be placed within 1.5 metres or edge of trench or 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 a 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 railing 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 the 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 and free from patent defects and shall be kept in good repair and in good working order.

ii) Every rope used 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 adequater means. Every hoisting machine and all gear referred to above shall be plainly marked with safe working load. In case of hoisting machine naving a variable safe working load, each safe working load the conditions 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 risk of accidental descent of load, adequate precautions shall be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energised, insulating mats, working apparel such as gloves, sleeves and boots, as may be necessary, shall be provided. Workers 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 or 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 at 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) Notwithstanding the above conditions A to N the Contractor is not exempted from the operation of any other Act or Rule in force.

ANNEXTURE A.

FORMS OF CERTIFICATES TO BE ISUED BY COMPONENT AGENCIES IN BUILDING CONSTRUCTION : :

1. Completion certificate to be issued by Building contractors working under proper contract documentation through Architects or developer in case no contractor is so engaged.

Completion Certificate (Contractor/Developers)

I/We _____ have undertaken the work of development on property bearing _____ as per architectural designs & plans prepared by _____ and Structural designs & plans prepared by _____ duly sanctioned by Municipal Corporation of Bombay under No. _____ dated _____ and I/We hereby certify that all materials used, workmanship and methodology employed in the construction, described hereunder at aforesaid premises, are as per prescribed standards. I/We further certify that no stipulations of applicable, codes, rules, regulations and architect's, Consulting Structural Engineer's or other Consultants' instructions have been infringed with to the best of my/our knowledge and the construction described herein after is complete in all respect to render it fit for occupation for the intended use.

Description of work _____
_____
_____

Signature of Contractor/Developer

Date : _____

Authorised Signatory.

Place : _____

Partner/Director/Proprietor.

Copies submitted to

1) Architects

2) Consulting Structural Engineer.

2. Form of Certificate to be Issued by Site Supervisor.

Completion Certificate (Site Supervisor)

I/We _____ have undertaken assignment as site supervisor on the work carried out on property bearing _____ as per architectural design & plans prepared by _____ and Structural designs and plans prepared by _____ duly sanctioned by Municipal Corporation of Greater Bombay under No. _____ dated _____ for M/s. _____ as developer. M/s. _____ has been acting as contractors.

In addition to my/our site reports and certificates submitted from time to time to architects M/s. _____ I/We hereby certify that all entire work has been carried out under my/our personal supervision satisfactorily. I/We hereby certify

that all materials used, workmanship and methodology employed for the consctruction described here under at aforesaid premises, by M/s. _____ are as per prescribed standards. I/We further certify that no stipulation of applicable codes, rules regulations any instruction and direction of Architect, Consulting Structural Engineer's or other Consultants have been infringed with to the best of my knowledge and the construction described hereinafter is complete in all respect to render it fit for occupation for intended use.

Description of work _____

_____

_____

Signature of Site Supervisor.

*Date :

Place :

Copies Submitted to :

1) Architects

2) Consulting Structural Engineer.

3. Certificate to be issued by Consulting Structural Engineer.

Structural Stability & Completion Certificate

I/We _____ have undertaken assignment as Consulting Structural Engineer for the work of Development on property bearing No. _____ for M/s. _____ Site Supervisor is _____ and contractors are M/s. _____.

Based on the completion certificate of contractors and Site Supervisor, and test reports and periodic site inspection carried out by me/through my staff from time to time, I certify that Structural work of the stated work has been carried out as per my/our structural design and details and to the best of my knowledge and beliefthe said structure is safe and stabler for which it is intended. One set of completion plans of the structural work are enclosed herewith.

Signature of Consulting Structural Engineer _____

Date :

Place :

Copies submitted to :

1) Architects
2) B.M.C.
3) Developers.

4. Certificate to be issued by Architects :

Completion Certificte

I/We _____ have undertaken assignment as architects for the development work on property bearing No. _____ for M/s. _____ as developer/Owner, sanctioned by B.M.C. under No. _____ dated _____. The following listed firms/persons are associated in the work.

Consulting Structural Engineer - M/s. _____

Address : _____

Owner/Developer - M/s. _____

Address : _____

Site Supervisor M/s. _____

Address : _____

Contractors M/s. _____

Address : _____

Based on completion certificate issued by :

1) M/s. _____ Developer/Contractors

2) M/s. _____ Site Supervisor.

3) M/s. _____ Consulting Structural Engr.

and periodic site inspection carried out by me/through my staff from time to time I certify that the work is carried out as per design and specification prepared by me/us. The work is carried out as per prescribed applicable standards and codes, rules, regulation and stipulations materials used, workmanship and methodology employed for construction work are of accepted standards, and the work is complete to render it fit for occupation for intended use, to the best of my knowledge and belief.

Signature of Architects : _____

Date : _____

Place : _____

Copies submitted to :

1) B.M.C.
2) Developer/Owner

ANNEXTURE I.

CONDITIONS OF ENGAGEMENT AND SCALE OF PROFESSIONAL FEES AND CHARGES AS PRESCRIBED BY INDIAN INSTITUTE OF ARCHITECTS

FOREWORD :

The profession of Architecture calls for men of integrity, business capacity and technical 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 adviser 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 responsibilities to his profession, associates and subordinates, he will not knowingly compete with a fellow architect on a basis of professional charges, finally he is engaged in a profession which carries with it a grave responsibility to the public. Therefore the Indian Institute of Architects, to maintain the highest standards of practice and conduct has adopted for use by all members of the Institute the following Conditions of Engagement and Scale of Professional Charges revised to conform with local requirements and conditions.

These conditions of Engagement are for the mutual benefit of both the client and the Architectect. They determine the minimum fees for which an architect may undertake work and describe in some detail the kind of professional services a client should expect in return.

A professional service is essentially a personal one, but the comprehensive responsibilities of the architect are often fulfilled in co-operation with members of other professions. It is the architects function to advice on the needs for otehr professional and he is responsible for the direction and integration of their work with that of his own. These conditions establish the basis for their co-operation.

The Architect-client relationship can be an exacting one, and the conditions of engagement are designed to cover all forseable situations and to establish a clear understanding about fees, services and responsibilities. To this end the Indian Institute of Architects is always willing to answer questions, and will welcome opportunities to explain the role of an architect.

The quallty of our environment must utlimately depend on the successful application of the architect's creative skill. These conditions of engagement should enable the architect to provide the services of the profession more effectively.

CONDITIONS OF ENGAGEMENT :

PART I.

Responsibilities :

1.0 Members of the Indian Institute of Architects are governed by the Constitution and Bye-Laws of the Indian Institute of Architects.

1.1 The Indian Institute of Architects code of professional conduct shall be the standard of conduct to which all members of the Institute whether remunerated by fee or salary must adhere failing which the council of the institute may judge a member guilty of unprofessional conduct and reprimand, suspend or expel him from the institute. Cases of unprofessional conduct, not specifically covered by the clauses of the code, are dealt with by the council having regard to the particular circumstances of the case.

1.2 The work of an architect is to study his client's needs and to advise to prepare, to direct and to co-ordinate design, and to supervise works, executed under a building contract. The normal services provided by an architect in fulfillment of these responsibilities is described in Part 2 of these conditions. Additional and special services are described in Part 7 and Part 9 respectively.

1.3 The employment of consultants shall be at the architect's discretion in agreement with the client. Where consultants are employed the architect shall be responsible for the direction and integration of their work. Consultants shall be solely responsible for the detailed design and supervision of the work entrusted to them.

1.4 The architect may also nominate specialist sub-contractors for the design and execution of any part of the work. He shall be responsible for the discretion and integration of their design and for general supervision of their work in accodance with Clause 1.7.

1.5 The architect must have the authority of his client before initiating any stage of his duties. Except as provided in Clause 1.6 any material deviation, alteration, addition to or omission from the approved design shall be made only with the knowledge and consent of the client. The Architect shall inform the client if the total authorised expenditure or contract period are likely to be varied.

1.6 The architect may authorise material changes in design if they are necessary for constructional reasons, provided that the client is informed without delay.

1.7 The Architect shall give such periodic supervision and inspection as may be necessary to ensute that the works are being executed in general accordance with the contract constant supervision does not form part of his normal duties.

1.8 Where frequent or constant inspection is required a clerk of works shall be employed He shall be nominated or approved by the Architect and be under the Architect's direction and control. He shall be appointed and paid by the client or alternatively may be employed by the Architect who shall be reimbursed.

1.9 Where the employment of a resident architect is agreed upon, he shall be employed by the architect who shall be reimbursed.

Remuneration :

1.10 It is the duty of a member to uphold and apply the scale of professional charges adopted by the Indian Institute of Architects. The employment of the architect shall therefore be in accordance with these conditions and the fees and charges herein shall apply unless a higher fee and charge is agreed upon between the architect and the client when the former is commissioned.

1.11 The scale of charges show percentage under two columns, the percentage under the first column does not provide any remuneration for work performed by civil, structural and mechanical engineers and quantity surveyors or for any other work performed by consultants. The percentage under the second column shall become applicable when all such services normally provided by other consultants are performed by the Architect's own staff.

1.12 When Consultants are employed, subject to clause 1.3 they may either be appointed and paid by the Architect, who shall be reimbursed by the client for such payments, or appointed and paid by the client.

1.13 Where work done by a client results in the omission of part of the normal service described in Part 2.1 of these conditions a commensurate reduction in fees may be made by prior written agreement, provided such agreement specifies in detail the work to be done by the client which would otherwise have formed part of the normal service by the Architect.

Liability of the Architect :

1.14 The architect is liable if he 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 hereunder :

a. The liability of the architect does not cover costs other than those for the reinstatement of the works. All liability for consequential damages is excluded.

b. The liability of the architect expires after 2 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 supervision.

e. The architect has no liability whatsoever for any damage resulting from an act of contractors or suppliers which is not in accordance with the contract documents 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 supplier.

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

Termination of Engagement :

1.15 An engagement entered into between the architect and the client may be terminated at any time by either party on the expiry of reasonable notice (normally three months) when the Architect shall be entitled to remuneration in accordance with Part 13 of these conditions.

Copy-right :

1.16 In accordance with the provisions of the copyright Act, copyright in all drawings and in the work executed from them will remain the property of the Architect. Drawings and specifications as instruments of services are the property of the architect whether the work for which they are made, be executed or not, and are not to be used on other work except by agreement.

Interpretation :

1.17 Any question arising out of these conditions of engagement and scale of professional fees and charges may be referred by the architect or the client to the Indian Institute of Architects, for advice at any time provided always that any

difference or dispute between them shall be determined in accordance with clauses 1.19 and 1.20.

Successors and Assignment :

1.18 The client and the architect each bind himself, his partners, successors, legal representatives and assigns to the other party to this agreement and to the partners, successors, legal representatives and assigns of such other party in respect to all covenants of this agreement.

Disputes

1.19 Any difference or disputes may, by an agreement between the parties be referred to the Indian Institute of Architects for a ruling provided always that such a ruling is sought on a joint statement of undisputed facts and the parties undertake to accept it as final.

Arbitration :

Where any difference or dispute arising out of these conditions of engagement and scale of professional fees and charges cannot be determined in accordance with clause 1.17 it shall be referred to the arbitration of a person to be agreed upon between the parties or failing agreement within fourteen days after either party has given to the other a written request, to concur in the appointment of an arbitrator, a person to be nominated at the request of either party by the President of the Indian Institute of Architects.

ARCHITECT'S SERVICES :

PART 2.

2.1 Sketch Stage :

i. Take client's instructions regarding the requirement of the the project as a whole.

ii. Acquaint the client with the conditions of engagement and scale of professional charges of the Indian Institute of Architects.

iii. Visit the site.

iv. Prepare in agreement with the client a programme of accommodation and requirements.

v. Examine legislation, code and standards as they affect the project.

vi. Prepare preliminary draft sketches and notes sufficient to explain the architect's general understanding of the clients requirements and the outline of his plan for the best way of fulfilling them including an estimate of the order of involved. Estimates of cost prepared from the preliminary draft sketches simply indicate from the Architect's experience the probable order of cost of the whole project (Under no circumstances shall the architect guarantee such estimate of cost) (Fees due 10 percent of the fee).

vii) Discuss the draft sketches with the client and make such modifications as may be necessary to satisfy the client that his requirement will be fulfilled. (Fees due 20 per cent of the fee).

2.2 Preliminary Stage :

i. Advise the client on the appointment of surveyors, consulting engineers and other consultants where necessary.

ii. Obtain from the client or prepare at the clients expense a detailed topographical survey of the site to a scale and contour interval determined by the architect. The survey shall include all the necessary data related to the existing Public Utility Services, lines of streets and pavements, building lines, adjoining properties, rights of lights, restrictions, easements, partywalls and boundaries.

iii. Assist in obtaining provisional approvals from statutory Bodies local and other interested parties.

iv. Obtain from the client or prepare at clients expenses test site borings, soil test and such other tests required to provide essential design data from sub-soil conditions, test shall be carried out as directed by the Architect or Consulting Engineers.

v. Prepare (with the assitance of consultants as necessary) a sketch scheme, report and estimate of cost in sufficient detail to enable the architect to proceed with the working drawings stage of the project (estimates of cost prepared with sketch scheme are intended for the clients budget forecasting).

vi. Obtain clients approval of the sketch scheme report and estimate of cost. Upon approval the architects services in connection with the preliminary stage have been completed. (Fees due : 35% of the fees).

2.3 Working Drawings Stage :

i. Advise client and obtain approval on the form of contract and method of placing the main contract.

ii. Discuss with the client and obtain approval for the procedure to be adopted with nominated sub-contractors and nominated suppliers.

iii. Discuss with the client and obtain approval for the procedure to be adopted in relation to imported materials and goods if required.

iv. Provide the surveyors, engineering consultants and other consultants with all the necessary information to allow them to perform their specialist work.

v. Prepare the necessary drawings and documents and undertake the agreed procedure in relation to nominated sub-contractors and nominated suppliers.

vi. Prepare the necessary schedules and documents and undertake the agreed procedure in relation to all materials and goods.

vii. Direct and co-ordinate the Architectural engineering and surveying work and prepare (with the help of surveyors, consulting engineers and other consultants if necessary) complete working drawings, schedules, specifications and bill of quantities (if required) to describe the whole project adequately for the purposes of placing the main contract by the approved method.

viii. Prepare (with the services of quantity surveyor if necessary) the approved form of contract; assist to obtain approval of the form of contract from Government and Government agencies when required.

ix. Obtain clients approval for any material deviation in design or cost or the working drawings, schedule and specifications from the approved such scheme.

x. Assist to obtain final approvals from statutory bodies and other interested parties; upon, finishing the working drawings, sufficient for starting the construction work in hand, schedules specifications, schedule of quantities (if required) and form of contract the architect's services in connection with the working drawings stage have been completed. (Fees due 65% of the fee).

2.4 Construction Stage :

i) Conduct the approved method of placing the main contract on behalf of the client (with 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).

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 to fulfil his obligations under the condi-ons of the contract.

iv) Assist the main contractor to prepare a works progress schedule.

v. Prepare and supply to the main contractor such further drawings, specifications or details which may be required for the proper execution of the works.

Upon placing all contracts and supplying all drawings to the various contractors the Architects services in connection with construction stage have been completed. (Fees due 80% of the fee).

2.5 Supervision Stage :

i) Check and approve shop drawings submitted by contractors.

ii) Give periodical supervision and inspection as may be necessary to ensure that the works are being executed in general 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 clerk of the works and other site supervisory staff, if appointed to provide constant superintendence to ensure that the work is carried out strictly in accordance with the working drawings and specifications.

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

v) Advise client if the contract time is likely to be exceeded.

vi) Advise client if the contract time is likely to be varied.

vii) Issue variation order on behalf of the client on client's instructions or if changes are necessary for technical reasons.

viii) Check main contractor's applications for payment (with the assistance of a quantity surveyor if necessary).

ix) Prepare interim valuations (with the assistance of a quantity surveyor if necessary).

x) Issue certificates authorising payments.

xi) Certify accounts.

xii) Certify the final completion of the works :
Upon issuing the final certificates, the architect's services in connection with the supervision stage have been completed.
(Fees due 100% of the fee)

ANNEXTURE II.

THE ARCHITECTS (CONDITIONS OF ENGAGEMENT AND SCALE OF CHARGES) REGULATIONS, 1982 :

NOTIFICATION

In exercise of the powers conferred by sub-section (1) read with clause (j) of sub-section (2) of section 45 of the Architects Act, 1972 (20 of 1972), the Council of Architecture hereby makes, with the approval of the Central Government, the following regulations namely : -

1. **Short title, extent and commencement :**

1) These regulations may be called the Architects (Conditions of Engagement and Scale of Charges) Regulations, 1982.

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

3) These regulations shall be in addition to and supplement the Architects (professional conduct) Regulations, 1982.

2. **Normal Services :**

2.1 **Preliminary Stage :**

The Architect shall

(a) take client's instructions regarding the requirements of the project as a whole.

(b) review with the client the schedule of accommodation and requirements.

(c) prepare preliminary Draft Sketches and Notes sufficient to explain the Architect's general understanding of the client's requirements including an estimate of the order of cost involved. (Estimates of cost prepared with preliminary Draft Sketches simply indicate from the Architect's experience, the probable order of cost, based upon common sense, of the whole project).

(d) discuss the draft sketches with the client and make such modifications as may be necessary to satisfy the client that his requirements will be fulfilled.

(e) advise the client on the appointment of consultants.

(f) obtain from client, or have prepared at the client's expense, a detailed topographical survey of the site to a scale and contour interval to be determined by the architect. The survey should include all the necessary data related to the existing public Utility services, lines of streets and pavements, building lines adjoining properties, rights of lights, restrictions, easements, party walls and boundaries.

(g) assist in obtaining planning approvals from statutory and other regulatory Bodies;

(h) Obtain from the Client or have prepared at Client's expense test site borings, soil tests, and such other tests required to provide essential design data from sub-soil conditions, tests shall be carried out as directed by the Architects or Consultants.

(i) Prepare a preliminary project report;

(j) Obtain Client's approval for the preliminary project report;

Upon approval, the Architect's services in connection with the Preliminary Stage will hve been completed.

(30% of fees due less the amount, if any, already received)

2.2 Working Drawing Stage :

The Architect shall :

a) advise the Client and obtain approval as to the method of placing the various contracts.

b) Provide the Consultants with the necessary information to enable them to perform their services and to co-ordinate their work.

c) Prepare, with the help of Consultants as necessary, the Working Drawings, Schedules, Specifications and Bill of Quantities to describe the whole project adequately for purposes of placing the Contract by the approved method.

d) Prepare, with the services of consultants, if necessary, the approved form of Contract: assist to obtain approval of the Form of Contract from Government and Government Agencies when required.

e) Obtain Client's approval for any material deviation in design or cost of the Working Drawings, Schedules and Specifications from the approved Sketch Scheme.

(65% of fees due less payment already received)

2.3 Tender Stage :

The Architect shall :

(a) conduct the approved method of placing the contract on behalf of the client (with the assistance of consultants if necessary).

(b) analyse and report on the results of the aproved method of placing the contract and make recommendations to the client to assist in the final selection of the contractor.

(70% of fees due less payment already received)

2.4 Construction Stage :

a) supply to the main contractor six copies of the working Drawings, Schedules, Specifications Bills of Quantities (if required) and other Contract Documents to enable him properly to fulfil his obligations under the Conditions of the Contract.

b) assist the Contractor to prepare a Works progress schedule for approval of the client.

c) check and approve shop drawings submitted by Contractors if required.

d) provide periodical supervision as may be necessary to ensure that the works are being executed in general accordance with the contract and the quality called for in the drawings/specifications.

(Constant supervision does not form any part of the duties undertaken by him and the Architect's supervision alone cannot guarantee that the work is carried out strictly in accordance with the Drawings and specifications).

e) direct the Clerk of Works and other Site Supervisory staff, to provide constant superintendence so as to ensure that the work is carried out strictly in accordance with the Working Drawings and Specifications.

f) submit periodic progress reports to clients.

g) advise the Client (with the assistance of Consultatnts if necessary) if the contract time or the total of authorized expenditure is likely to be exceeded.

h) issue in writing Variation Orders on behalf of the client if changes are necessary for technical reasons.

i) check Main Contractor's application for payment (with the assistance of consultants if necessary) and issue certificates authorising payment.

j) advise with regard to delay in building operations arising from bankruptcy or liquidation of the contractor or from any other cause beyond the control of the architect.

k) certify accounts.

l) certify the final completion of the works and assist in obtaining completion certificate when necessary.

m) render advice and assistance to clients whenever disputes arising out of contracts are referred to arbitration.

n) supply 2 sets of completion drawings as built to the owner.

Upon issuing the Final Certification the Architect's services in connection with the Construction Stage will have been completed.

(100% of fees due less payment already received)

3. **Additional Services :**

An architect when asked by a client, shall,

i. advise on the selection and suitability of sites;

ii. conduct negotiations with owners of sites and buildings;

iii. make a survey after measurement;

iv. prepare plans of sites and buildings;

v. inspect, prepare reports or give advice on the conditions of premises;

vi. prepare details of dilapidations and negotiate for repairs of the same and also supervise the repairs of such dilapidations.

vii. make investigations into structures to ascertain whether there are any defects in the walls, roofs, floors and drains which may materially affect the life and value of the said structure;

viii. undertake a preliminary technical appraisal of a project which may include an approximate cost required on such project and suggest an outline time table in regard to the same.

ix. prepare master plans for the ultimate development of site in two or more stages;

x. prepare special drawings, photographs, scale models, folders and reports for the use of the client;

xi. amend drawings or specifications or prepare new drawings or specifications to give effect to alterations in accordance with the instructions of the client;

xii. prepare development plans for a number of years in respect of any large building or complex of buildings;

For the services listed above, the architect may take the assistance of consultants wherever necessary.

ANNEXURE III

REGULATIONS FOR THE GUIDANCE OF LICENSED SURVEYORS :

Regulations prescribed by the Municipal Commissioner for Greater Bombay with the approval of the Standing Committee for the Guidance of Licensed Surveyor pursuant to the provision of Section 356 of the Bombay Municipal Corporation Act : -

1. It will be incumbent on every Licensed Surveyor,in all matters in which he may be professionally consulted or engaged, to assist and co-operate with the Municipal Commissioner for Greater Bombay and other Municipal Officers in carrying out and enforcing the provisions of the Bombay Municipal Corporation Act, and of any bye-laws for the time being in force under the same.

2. Every Licensed Surveryor will, in every case in which he may be professionally consulted or engaged be responsible, so far as his professional connection with such case extends, for due compliance with the provisions of Chapters, IX, X, XI and XII of the Bombay Municipal Corporation Act and of any bye-laws for the time being in force under the said Act, or such of them as may respectively be applicable to the circumstances of the particular case and in particular it will be obligatory on him to satisfy himself that a qualified and competent Maistry or Inspector of Works is constantly employed and present on the work to supervise the execution of all rubble work and to prevent the use of any defective material therein and the improper execution of any such work.

3. In every case in which a Licesed Surveryor is professionally concerned in connection with any building or work upon any premises, in respect of which a right to require a set-back has accrued or is about to accrue to the Commissioner under the provisions of Sections 297, 298 and 299 of the said Act, or any of them, it will be incumbent on such Licensed Surveyor to ascertain whether "the regular line of the street" has been prescribed under Section 297, and whether any portion of the said premises is required for the street, and no Licensed Surveyor must, on any account or under any pretence whatever, be a party to any evasion or attempted evasion of the set-back (if any) that may be required.

4. In every case in which a Licensed Surveyor is professionally concerned in connection with any building or work upon any premises designed or intended to be used for any purposes in respect of which the written permission or licence of the Commissioner, is prescribed by the said Act as a necessary condition to the establishment or use of such premises for such purpose, it shall be incumbent on such Licensed Surveyor, so far as his professional connection with such case extends, to see that all conditions prescribed by the said Act, or by any bye-law for the time being in force thereunder, in respect of premises designed for or intended to be applied to such use, are duly fulfilled or provided for.

5. A licensed surveyor shall not carry out any work in connection with any building or other erection on a plot of land leased or agreed to be leased by the Municipal Corporation in contravention of any term or condition of the lease or agreement for lease.

P.E.A.T.A.

ANNEXURE IV/1

10th June, 1983.

To,

The Director,
Engineering Services & Projects,
Municipal Corporation of Greater Bombay,
Administrative Building Extension,
Mahapalika Marg,
BOMBAY 400 001

Dear Sir,

Sub : Meeting with members of Consulting Structural Engineers Sub-Committee of PEATA on 4th May, 1985

At the outset I on behalf of members of my sub-committee and myself express our sincere thanks for the very patient and kind hearing you gave us on 4th May 1983 to discuss the various problems connected with practice of Consulting Structural Engineers within the limits of Municipal Corporation of Greater Bombay.

We were overwhelmed by your very generous attitude to our points of view and it was your magnanimity to have offered your comments on the spot on these issues.

The basic issues of immediate concern and discussed can be classified into two main categories.

(A) Department's Procedural matters.

(B) Likely Legal Responsibility of Consulting Stuctural Engineers Vis-a-Vis present Proforma draft for structural Completion Certificate.

(A) About the procedural matters the issues were mainly two on which you have been kind enough to accept our point of view as a step towards healthy practice. You had communicated your agreement with these two issues and had directed your personal secretary to issue instructions in the department accordingly.

They were : -

i. In the event, the Developer/owner chooses to appoint another Consulting Structural Engineers after the acceptance memo is once submitted by one Consulting Structural Engineer, the department will insist on N.O.C. from previous Structural Engineer.
This practise already being in operation in respect of Licenced Surveyors/ Architects.

ii. Occupation, Part or Full, or B.C.C. will not be accepted without Structural Completion Certificate from Consulting Structural Engineers who has been originally appointed and also in accordance with (i) above.

(B) We had explained to you about the limitations of supervision by Consulting Structural Engineers, the same being "Acceptance Supervision". The present draft

proforma in which form it is required of Consulting Structrual Engineers to submit structrual Completion Certificate.is highly commital and would absolve the Owner/Developer of all his deeds and misdeeds even after completion of R.C.C. frame work. To emphasise this, many of members in the meeting had expressed their experience of noticing by change occurence the cutting of major R.C.C. members by various other agencies, who take over the finishing work on R.C.C. built frame work like Plumbers, Electrical Contractors, Interior Decorators etc. It was our view-point that in the present system of majority of construction work being undertaken by Builders/Developers, the old system of employment of renowned Building Contractors who used to be by themselves conscious of their responsibilities vis-a-vis their reputation has since been gradually replaced by labour contracting agencies or even direct labour employment. In most of these cases the Builder/Developer is neither a qualified Civil Engineer nor experienced Building Contractor.

After lengthy discussion, it was arrived at that we submit 2 to 3 alternative drafts for proforma of structural completion certificate for revision by your Office.
All our members present had expressed that we do not intend in anyway to get away from our responsibility for our Structural Design and "Acceptance Supervision".

Accordingly, I am submitting herewith three alternative drafts which are finalised after detailed discussion amongst our sub-committee members. I request you to please give your just consideration to the same.

At the end, I take this opportunity to once again thank your kind-self for the keen interest taken in our discussion and hope to continue the dialogue towards healthy professional practice in future too.

Yours faithfully,

sd/-

(SATISH C. DHUPELIA)
CHAIRMAN, STRUCTURAL ENGINEERS SUB-COMMITTEE.

ANNEXTURE IV/2.

21st June, 1983.

To:

The Director,
Engineering Services & Projects,
Municipal Corporation of Greater Bombay
Administration Building Extension,
Mahapalika Marg,
Bombay -1.

Dear Sir,

Sub : Meeting with Members of Consulting Structural Engineers Sub-Committee of PEATA on 4th May, 1983.

You must have already received my letter of 10th June, 1983, with reference to the meeting of our Sub-Committee for "Consulting Structural Engineers" with you on 4th May, 1983. I hope necessary instructions as were discussed, may have already been passed by your office to concerned officers.

There was one further pertinent point and that was as regards need for enforcing stricter and responsible day to day supervision on construction work within the limits of Municipal Corporation of Greater Bombay. This issue I had specifically kept out of the previous letter, sothat it may not confuse other procedural matters, which, with your consent were formerly accepted. This particular aspect will need, as we had discussed, a prolonged discussion and follow-up action on part of PEATA, your office and other Associations connected with the trade and activity of Building Construction.

In view of the discussion of Para (B) of our letter of 10th June 1983 and a pragmatic approach towards better construction in Bombay, we had suggested creation of an agency to be licenced/registered by Municipal Corporation of Greater Bombay who should be in charge of overall and continuous supervision of Building Development work. For it is with this responsible agency in charge of construction that many pitfalls in quality as well as execution of construction work can be avoided and better construction can evolve. This will be achieved gradually, though overnight change in quality cannot be achieved.

On your suggestion we are collecting various data and details as were suggested by your kindself as also gathering information as to the practice being followed in other major cities/countries of the world.

I shall revert back on this subject as soon as we are ready with thee information and their compilation, which I think should be possible by August/September 1983.

At the end I take this opportunity to once again thank your kindself for the keen interest taken in our discussion and hope to continue the dialogue towards healthy professional practice in future too.

Yours faithfully,

sd/-
(SATISH C. DHUPELIA)
CHAIRMAN, STRUCTURAL
ENGINEERS SUB-COMMITTEE.

P.E.A.T..A.

ANNEXTURE IV/3

17th June, 1985.

POINTS FOR CONSIDERATION FOR DESIRED IMPROVEMENT IN PRESENT BUILDING INDUSTRY IN BOMBAY :

Prepared jointly by

- **P E A T A**
- Institution of Engineers (India) Maharashtra State Centre,
- Indian Institute of Architects, Maharashtra Chapter.

AGENCIES INVOLVED IN THE BUILDING INDUSTRY ALONG WITH THEIR OBLIGATIONS

1. LAND OWNER :

A person holding a right to the land as per statute, capable of disposing his rights in the property. Either he develops the property or as per his right in accordance with prevalent statue of Land Ceiling, or hands it over to a Developer to develop. For the development his titles are to be cleared and certified by statutory officers, Notaries to develop a property.

2. DEVELOPERS :

A developer is a self-employed turn-key contractor undertaking to supply self contained residential, commercial or industrial unit for consideration.
His role : -

i. Buy development rights;
ii. Appoints Architect & Structural Designer ;
iii. Applies for permission from statutory authorities under power of attorney.
iv. Invests money in construction/development;
v. Arranges construction agency/agency for executing the same;
vi. Enters into the sales agreement and finally, as per agreements, hand over the unit to purchasers and clears his dues.
vii. conveys the title of land from original owners to final occupants;
viii. He is the main person guiding the entire project and is the sole beneficiary of the profits arising out of the development. As such, he is the final responsible person answerable to the authorities and the society for his acts. Therefore, he must indemnify the authorities, technical personnel and his clientele (purchasers) and the society at large. His liability in this respect may be considered upto a period of 7 years.

3. ARCHITECT :

A person having requisite qualification to design and translate the developmental requirement into concrete terms and shape, and appointed by the person intending to develop a property.

Role .

i) To take instruction from his client.
ii) To prepare preliminary drawings.
iii) To assist the client in obtaining statutory approvals.

iv) To advise client in the execution of the project by assuming the role of lead co-ordinator and assist him in due execution of project. In this behalf, he may, depending on exigencies and requirements, do the following : -

Preparation of working drawings, schedule of quantities, contract documents, and have general control over the work by providing acceptance supervision.

4. **CORPORATION :**

A statutory authority to control the development and building work to ensure the public health and safety.

5. **STRUCTURAL ENGINEERS:**

A person having requisite qualification to design the struture eppointed by the Architect/Client in concurrence with either party. He assumes the role of the designer under the Architect, including acceptance supervision of structure.

6. **CONSTRUCTION AGENCY :**

Personnel or Agency appointed by the Owner/Developer, preferably in consultation with the Architect, to execute the construction work in workman like manner and having requisite skill to fulfil and adhere to the designs and specifications by assuming the charge of site works itself, capable of and responsible for the correct interpretation of drawings, quantities, specifications of works and its due adherence and for the control of material and labour.

7. **CONSTRUCTION SUPERVISION/CLERK OF WORKS :**

A person appointed and paid by the Owner/Developer in consultation with the Architect, having requisite technical competence, assuming the role of constant construction site supervisor under the general control and instructions of the Architect, Structural Engineer and other Consultants.

For effective control and consciousness of his responsibility and being accountable for any lapse on his part, this important link for due translation of drawings, designs, specifications and instructions should directly report to the Architects, other Consultants, as the case may be.

In order to ensure the satisfactory performance of his duties and adherence to the control exercised by the Architects and other Consultants, a statutory obligation may be conceived.

8. **SERVICES :**

Nominated or appointed Sub-contractors by the Owners/Developer in consultation with the Architect to adequately design, install their part of the obligations in workman like manner for long term satisfactory performance with adequate test checks to the satisfaction of concerned Consultants.

CONCLUSION :

Work of Buildings is that of team work, each of the agency mentioned above must be responsible and made aware of their duties and functions alongwith suitably conceived statutory obligations to serve the common need to safeguard the interest of the masses.

ANNEXTURE IV/4.

17th June, 1985

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

It is an unfortunate commentary on human nature and the psychology of the individual that we need construction inspection but need it we do. The present modus operandi, specially in the field 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 the roles of "Buyer" and "Seller" and all have to play their part. The rule of "Caveat Emptor" (let the buyer beware) has to be not oly philosophical, but legal. In construction where the product is built in place and often takes years to develop, the "Buyer" should have an unusual opportunity to look over the shoulder of the "Seller". Unfortunately both the above are not to be as is known to most.

It is in the face of the above that the real and accepted need for construction inspection by 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 infra-structure. 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 RCC columns, and verification of the same on each floor successively as work proceeds.

ii. Proper mixing of concrete for RCC 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 curing of structural RCC members.

vii. 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.

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

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

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

xi. Prevention of damage to structural RCC members for concealed electrical wiring, and concealed plumbing.

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

These are only a few of the finer points which constitute contribution required by on-site responsible continuous construction supervision/Inspection, which certainly cannot be expected of licenced 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 a 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 with

* Institution of Engineers (I) Maharashtra State Centre.

* Institute of Architects (I)

ANNEXTURE IV/5

PRACTISING ENGINEERS ARCHITECTS AND TOWNPLANNERS 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 has reference to the various meetings with your goodself attended by members of our Executive Committee and Members of Structural Engineers Sub Committee, when we had been representing our view point about need for effective and continuous repsonsible supervision on construction in Bombay.

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

For any further discussions you need our presence for further clarifications, elaborations on our proposed 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/-
Atul C. Desai
PRESIDENT

PRACTISING ENGINEERS ARCHITECTS AND TOWNPLANNERS ASSOCIATION

DRAFT PROPOSAL FOR PROVIDING POROPER AND CONSTANT SUPERVISION ON BUILDING CONSTRUCTION STITE BY MEANS OF AGREEMENT BETWEEN ARCHITECT AND DEVELOPER ALONG WITH REGISTRATION/LICENCING OF BUILDING/DEVELOPER AND CLERK OF WORKS :

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 one 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 times even industrial. In most cases these individuals or their firms lack even basic qualifiction/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 yers all constructions 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 per design and specification, payments only on certification by architects, 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 contractors and builders/developer themselves performing the partial task of building contractors namely building material suply 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 tothe 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 knowledgeble 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 construction 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 their life savings. Last two decades or so have witnessed the fast deteriorating standard of building construction and consequent spate of recent building collapses in the country, inclusive of Bombay.

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

Proper building design as per regulations and codes.

A. Proper agency to supervise the work and inspection of materials.
B. Proper agency to carry on the work.
C. Proper and correct supply of building materials.
D.

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

In order to bring about satisfactory and just solution of such problems the following remedial measures are suggested based on the requirements of good, sound and economical construction 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 no provision in present Bye-Laws for ensuring responsible and effective day to day and constant supervision of private construction in Bombay.

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

The stability and completion certificates are issued by architects and engineers, on the basis of general inspection and in good faith that the materials used and workmanship engaged is as per specification laid down, and to the best of their knowledge and belief. The acceptance certificates 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 out of which good construction can accrue as detailed below, can be achieved and implemented only through responsible constant supervision.

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 carpentary work.
G. Adequate waterproofing of terrace, water tanks and toilets.
H. Sanitary and plumbing work using proper materials and jointing 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 MGGB., 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 implmentation on site and other aspects related to it since now they have a direct control and responsible towards its sufficiency.

PRELIMINARY :

The suggested remedial mesure 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 hve to be enforced 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. Insistance of details of constant site supervision during the period of construction.

   This may be done in two ways :

   By providing for specific agreement between Builder/Owner/Developer and Architect for

   a. Appointment of clerk of works
   b. By construction management contract.

2. Condition in IQD., 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 in terms of 1(a) or 1 (b)

4. Guide lines for appointment for proper qualified supervisor in case of building 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 than the alternative II may be followed and enforced within the period of three years so as to avoid any undue hardship.

1. Registration/licencing of builder/developer by making amendment to schedule M of section 394 of B.M.C. Act of 1888 and making it compulsory for builder/developer to take licence to carry on trade of building units on ownership basis. Such licencing should be for the firms. The administration, its conditions etc. should be handled by the building department of BMC. and not the licencing department.

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

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

DEVELOPER :

A developer is self employed turn key contractor supplying self contained 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 divided into self contained 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 architects, 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 conditions are envisaged and imposed on 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 plans 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 becaue 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 a vacuum of supervision agency resulting in the deterioration in the quality of construction work, and to the state of affairs as exist today.

Architect is an agent of client. He derives his powers by virtue of his appointment as an architect and his terms of engagement do not clearly provide for his right, duties and liability of construction site which was clearly defined in the condition of the contract. Under the circumstances it is suggested tht the BMC, 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 per the draft agreement annexed hereto providing for purchase of materials from suppliers and providing for the constant supervision by competent supervisor at the cost of owner/developer or by virtue of an agreement for construction, or by management contract between owner/developer/architect be considerd to be satisfactory for proper supervison 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 function::

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

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 and exegencies 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 discrepency 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 building construction.
e. Ability to take correct measurement to check the centre line of different structural members and walls.
f. Ability to control labour.
g. Ability to properly give report in writing to architect or consultants as per their requirement.

CLERK OF WORK GRADE : I

For buildings 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 qualifications 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 of 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) of B. Arch. or other equivalent recognised qualification with one year's experience after graduation;

OR

Diploma in Civil Engineering or Architecture with 3 years experience.

OR

A person who in the opinion of 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.

MAJOR POINTS TO BE INCLUDED IN THE CONTRACT FOR SUPERVISION BETWEEN ARCHITECTS & 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. Architects supervision will be periodical and acceptance supervision depending upon the nature and progress of the work,but he will atleast visit the site minimum once in a 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 advise of the architect at a salary as advised by 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 consultants, types of work to be carried out in the physical presence of supervisor etc. Any other contractors working on the building construction site shall be given the work subject to this stipulation by the owners as per the advice given by architects.

4. Architects shall have right to dismiss, suspend,replace any 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 direction 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 advised 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 as 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 substandard materials for the intended constructions to the best of this 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 the termination of the 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 any statutory authority.

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

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

10. The supervisor or clerk of work shall be deemed to be the architects' representative on site subject to the power authority assigned that may be delegated, to him from time to time in writing by the architect.

10(a) The architect may at his decreation delegate the power and authority vested in him by 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 be given by the architect provided as follows : -

11(a) Failure ofclerk of works to disapprove work or materials shall not prejudice the power of architect there after to disapprove such work or materials and to order the pulling down removal or breaking up and opening out of the work for inspection at owners cost.

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

12. This agreement is supplementary to the terms of engagement of the architects and can be terminated by either party by giving three months notice with a copy of such notice to 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 arbitration proceedings, unless contract is properly terminated.

14. Appointment letter to the clerk of work shall be issued by the architect counter signed by owner/developer in confirmation thereof. The appointment shall specify the details of scope of services, duties, responsibilities, right and and emoluments to be given to the clerk of works. The payment of salary/emoluments to clerk of the work shall be done through architects only.

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

VII. WHETHER AT PRESENT ENOUGH NUMBER OF PERSONS OF SUCH CATEGORY ARE AVAILABLE :

In view of the classification of categories in para V above there should not be much of difficulty in having such personnel being available. However, the introduction of need for such proposal by statutory provision, more and more such new entrants will get incentive to join the course, of studies which now ample colleges and polytechnic have started. In case of difficulties Corporation may at its discretion allow, on special recommendation of architect whose supervision memo, is filed any person who in the opinion of such architect is capable of supervising such work and Corporation may accept certificate issued by such supervisor.

VIII. WHETHER PEATA CAN AND SHOULD ACCEPT RESPONSIBILITY OR OBLIGATION OR TRAINING AND CERTIFYING OF SUCH CATEGORY OF SUCH PERSONS I.E. UP GRADING OF PRESENT LOT OF SITE MISTRYS / SUPERVISORS WHO ARE NOT QUALIFIED BUT CAN BE TRAINED TO SHOULDER THE RESPONSIBILITY.

PEATA as a responsible body with its main aim and objective being rendering of better services amongst professionals and to the welfare of society at large can offer to participate to the extent the local authorities desires its involvements. This, however, can be identified only after knowing the extent of involovements desired of PEATA.

P.E.A.T.A.

ANNEXTURE V.

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

CAUSES, RESPONSIBILITIES & INDICATORS TO SCIENTIFIC INVESTIGATIONS & STUDY OF FAILURES

CRISIS OF FAILURES :

J.R. PATWARDHAN :

DIRECTOR, ENGINEERING SERVICES & PROJECTS,
MUNICIPAL CORPORATION OF GREATER BOMBAY.

In order to understand the anatomy of failure in our construction industry, we have to review the input factors which contribute 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 assigned 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. This 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 sector/special agencies if there is no in-house expertise to tackle unusual or highly specialised 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 fixed 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. Anyone who is capable to invest and to organise construction job becomes a developer or a builder. Here the identity of a 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 undertakes the job. The professional is responsible for the overall control and general supervision to ensure that the general quality is maintained and work is executed as per drawings 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 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 licenced chemist full time on the job. But, very prudently this enactment is insisted.

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

REVIEW OF FAILURES :

With the experience of failures which have occurred of late in the industry it has become 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 types 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 its investigations and submits its findings to the authorities or the clients. Then law takes over either in the court or in 'commission', which views the total aspect in legal language only. The court or the commission is normally guided by the 'findings' of the technical committee - However, it is their own discretion to decide the issue. This is where the whole problem lies. Judges are human beings and are likely to be carried away by the manner in which the matter is presented to them by the lawyers. It is usually a battle between technical aspects and legal representation of the same which may miss certain important clues either inadvertantly or deliberately. At this stage, it is necessary to realise how important it is for Engineers to be made aware about these legal procedures and steps they may be required to take to guard their own interest logically and 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 evolve procedures to face them. One should have correct guidance and protection from seniors and from professional institutions for following correct methodology of investigation and proper interpretation of technical and legal aspects.