

## **e-conference on Professional Issues in Structural Engineering in India**

*(26-31 August, 2002)*

*hosted by*

National Information Centre of Earthquake Engineering  
Indian Institute of Technology Kanpur

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**Chitra N. Javdekar [Thu Aug 29 08:34:01 2002]**

Dear Dr. Jain,

Thank you for focusing on solutions. In my previous posts, I have proposed some solutions and I believe that we need to come together for solving any problem. Although I invite those who are interested to look for details in my previous posts, I am summarizing what I think is necessary for this conference to succeed.

1. We must come together in the form of either e-committees or physical committees and form separate groups to lay out our concerns and develop advising network that will be communicating with the government and other civil/structural engineering institutions in India. For more details regarding the possibilities of committees please see my previous posts.

2. I feel that we should come up with a publishing forum that will be useful for practicing engineers and consultants who want to contribute to the knowledge base. This has to also be passed on to civil engineering students and their level of involvement should increase. This alone can bring forth the best in our engineers.

I would be interested in getting involved in any of these activities and work with others in the field to share our interests and ideas.

Thanks

Chitra Javdekar

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**Jitendra Bothara [Thu Aug 29 08:35:00 2002]**

Hi friends,

I really support points raised by Prof. Jain: let's take small initiative. It will not only help us to develop infrastructure for code implement, understanding of issues as well.

1. Issue of IIStruct E: Formation of a committee/ society is not a big deal, I guess. The problem is: how it can enforce someone to follow its rules till it is not supported by any law. May be we need Engineers' Law or Chartered Engg. Law. As far as it is learned from on going conference, it does not seem a easy task. Even if we do have law, it is not easy task to enforce/ monitor it. That's what our experience in Nepal. The draft for Engg Act was prepared in 1994, bill passes by Parliament in 1998 and got seal the same year. The Engg Council was formed. Unfortunately, I do not see any improvement because of it on our common practice. The days and night are passing the same way as it were before the act. The dream of improvement is gone! Building Act was passes in 1998 in Nepal to monitor/ improve building stock but still waiting for enforcement. I don't think scannerio is much different in India.

2. Lets' do what we can do on our own: I think we should focus more on awareness raising, dissimination of knowledge (not only among general public but engineers as well) that we can do on our own and we do not need any legal support for it. Someone among the participants raised a issue of debate with other structural engg (M. Struct) on is earthquake resistant design required or not for 10 storey building? We can find many such instances. It is not problem of defending struct. engg.. as he might even know much about earthquake resistant design. Lets come to ground reality. How many of Indian (or even Indian sub-continent) engineering universities/ colleges offer earthquake resistant/ construction on regular basis. I have seen many designers (even from big consulting companies) who just assume earthquake resistant design as an extraploation of vertical load design and design structures considering earthquake load but miss out basic ductile detailing. Whom to blame?

3. As an outsider, I am really surprised to know that in India there exist only eight institutes (seven IITs and one IIS) which are reconizable. I understand these are among the best institutes. However the question is: are the rest of all the engineering institutions are just "scrap". Are not in the name of "Standardization" we are trying to marginalize and undemine others. I guess, this trend might not take in good direction.

With warm Regars,

Jitendra K Bothara,

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**K. N. Chandrashekar** [Thu Aug 29 08:36:01 2002]

Mr Pankaj Gupta,

I can fully understand your agony, as I've gone thru something worse. One of my designs was not cleared for over a month and when I met the concerned engineer

for a follow up, he told me that he hadn't even begun checking (after a month!) as the drawings and designs were in SI units and he was familiar with only FPS system!

K.N.CHANDRASHEKARAN

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**Debabrata Bhadra [Thu Aug 29 10:40:01 2002]**

Dear friends,

Now at the middle of the conference we are rightly talking about solutions which I had requested in my previous mail. Well, let me put up some humble suggestions towards thr great cause.

1. Development of awareness in the Civil Engg. Community and general public i.e the customers. Articles on Structural failures with photographs not only in tech journals but also in news papers and magazines.
2. Inclusion of Dynamic Structural analysis in the undergraduate curriculum. Many practising engineers do not go for PG. Let us also not confine only to earthquake resistant design and construction but extend it to dynamic analysis to cover other dynamic forces.
3. Emphasis on construction materials and practice in the civil engineering curriculum. This aspect is somewhat neglected.
4. Formation of an Instt. of Structural Engineers with specific practical aims and objectives.
5. Introduction of Technical Audit for which some law may be necessary to make it mandatory.
6. Continual technical upgradation of professional engineers through practical short term courses/ seminars/ workshops etc.--- Dr. Sudhir Jain is doing a commendable work and we expect more.
7. Making avilable relevant books , journals, articles, seminar proceedings for non-participants et. at affordable price.
8. Creating an environment of excellence through suitable motivation , public perception etc.

Once we decide about the achievable solutions, we are to think of action plan in the next stage.

Regards,

D.Bhadra.

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Suneel Voditel [Thu Aug 29 11:08:01 2002]

Dear Colleagues ,

I fully support Ms. Chitra on her observations particularly on formation of a publishing forum for exchanging our experiences and knowledge .

Though a sub-issue , (and also one that would evolve later when E-committees are formed and we start interacting with each other more regularly ), I thought the foll. needs to be referenced here ,

\* Poor fee structure has driven many a Consultant (Pl. note that this pertains to small residential, apartment projects in towns/cities and not works of Consulting Firms ) to go for more number of jobs and in the process issue RCC details in the form of "Bar Bending Schedules " instead of detailing all the beams or slabs or whatever . Resorting to rules of thumb is also still prevalent.

Now , what happens is that a lot of crucial decisions ( such as lap lengths, embedment etc. ) on the field are taken by the Site Engineer or the Bar Binder. He too being unaware of the design philosophy would prefer to err on the safer side . More often than not , steel consumption estimates go hay wire.

This definitely sends wrong signals to the Developer, Architect or Home Owner as our work is seen merely as a piece of paper with "only broad guidelines".

Deviations & last minute changes (such as making 1m cantilever to 1.3 m ( and he says he has added 1 bar extra from what is designed ) is common and we are expected to take responsibility as we are the OFFICIAL STRUCTURAL ENGINEER.

With high quality software and fast computers available today , the need is to lay out each and every RCC member on the drawing (in elevation, plan , section etc.) and start presenting to the minutest detail.

It is then that the "ACCOUNTABILITY" as also "IMPORTANCE" of a Structural Engineer would be projected to the Society in its right perspective.

Though we all know that we deserve a better fee structure ,it is the Quality of our Designs and Dwgs.that would advocate a hike for us.

As has been rightly mentioned earlier by co-participants in this conf. ,the need of involving Students ,fresh Practitioners,this is the one area where support can be expected .In the process they would learn the finer points of Engineering. This could also include rigorous analysis of certain areas such as complex 3D modelling etc.( which a Senior Consultant may not be able to carry out for want of time ).

Teachers from Engg. colleges would also be glad to involve themselves in such activities in their spare time .

Final yr. students can work as "Trainees" along with draughtsmen in imbibing their drafting skills in design offices.

Responsibilities and Remuneration could be per guidelines of the Nodal body.

With sincere warm regards to all....

Suneel Voditel

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**Shashi Kant Thakkar [Thu Aug 29 13:09:00 2002]**

Many useful ideas are emerging from the e-conference. In fact there should be two days full conference on the subject with some invited presentations.The professional societies on Structural Engineering some recently formed can deliberate on the issues and produce manuals to start with. The issues of licensing and code of ethics are extremely important, educating the engineers can be important step in the direction of implementation.

S.K.Thakkar

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**Alpa Sheth [Thu Aug 29 13:10:59 2002]**

Hello,

I noticed a fine line in one of the emails regarding desirability of registering Professional Engineers and Consulting firms. The same distinction appears in the objectives of the Engineers Council of India <http://www.engineeringcouncilofindia.org> This is an important distinction.

IN the post-earthquake scenario in Ahmedabad, there was almost a manhunt for the "errant" structural engineer whose building had fallen. But it was found that in many buildings, the structural engineer on the municipal record was not the real designer of the building. WHO then has to take on the legal as well as moral liability?

In AHmedabad, like in Mumbai, there is already a licensing system of some sort for structural engineers in place, though this does not entail taking any examinations- Without this license one cannot officially practise in the city. But quite often, consultants do not use their own structural engineering license but use the license of a small-time structural engineer registered with the corporation while submitting building proposal.

The reasons are manifold:

- a) Some consultants have not registered with the corporation for various reasons
- b) Some consultants do not wish to sign the stability certificate which is mandatory and which perforce makes them commit to having supervised the building and thereby certify the quality of construction when they have not really done so.

Also, in a situation wherein the license of an employee of a firm may have been used in a project, who takes responsibility for the project when the employee leaves the firm?

In order to address this issue and also to discourage the system of dual structural engineers (design structural engineer vs. municipal structural engineer) on a project, the idea of registering not just the individual but also the firm was mooted. This will hopefully eliminate the fly-by-night structural engineer.

Another suggestion put forward was that for a firm to be registered as Consulting Engineers, a majority of the partners/directors have themselves to be certified Professional engineers. This is a welcome step as it will discourage architectural or other service providers from projecting themselves as engineers with just one token engineer in the firm.

It would be nice to hear of others' views/experiences on this issue.

Alpa

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It has been interesting going through emails in this e-conference. In terms of suggestions/possible solutions, I have seen some initiatives in Uttaranchal, which I would like to highlight here. In Uttaranchal, the Government is talking about integrating Earthquake Resistant measures in the Awaas Yojanas. Also, my office, Asian Disaster Preparedness Center, Thailand is implementing a Technical Assistance program in Uttaranchal (funded by ADB) for strengthening disaster mitigation and management. Under this program, a workshop was done with building centers, discussing means of getting building centers more involved in earthquake resistant construction, training for masons in a way that better non-engineered construction takes place. I think that the government/private sector organizations that undertake major construction work, without appropriate structural understanding must be targeted for promoting construction of safer structures in the future.

Sincerely,  
Supriya

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**A.Olavo Carvalho [Thu Aug 29 14:35:01 2002]**

Hi Colleagues,

I am following the e-conference very closely.

I have the following to note :-

a) I am finding that we engineers have developed an inferiority complex with regard to Architects. I have been in the profession for the last twenty years and am working with different Architects. In 75% of the projects we are carrying out the structural design, we are involved with the architect from the conceptual stage of the project. We see no problem co-ordination with architects, who do accept suggestion and recommendation given by us. Even in the balance 25% projects, the architects do consider our suggestion and make relevant changes. Ultimately it is team effort, which does wonders. Ultimately they are trained as Architects and we as Engineers. Respect them for that and we will get our due respects.

Why this collision path? ? ?

b) I find more problems with my colleague engineers, who try to under quote to get jobs. But our experience is that we should ignore such colleagues, who may succeed in taking a job here and there, but in most cases the clients have been

returning to us with their future jobs. In most cases we have been getting fees based the IIA recommendation. (We follow this since we have no mode of payment of our own).

c) I think we need to strengthen our education base. I was happy to attend the course conducted by Dr. S. Jain & Co., in 1995, Finite Element Method and CAD I Civil Engineering by Goa Engineering College, Seismic Design and Detailing of RCC Framed Structures by ISSE.

I would have been happy if some more from the engineer's faculty & Authorities Conducted more such courses, so that the entire engineering community could Benefit from such courses. I would like some comments on the above.

A.OLAVO CARVALHO

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**Sivakumar K [Thu Aug 29 14:37:01 2002]**

Dear Friends,

Good afternoon to all of you. I would like to raise the following issues of importance and look forward to your valuable suggestions and views.

The various building regulations become a flop when the authorities take punitive action against the violators without logical structural thinking. If a building does not have a proper or sufficient frontage, the civic authorities demolish the encroaching portion of the building and the problem ends for them there. Legally the building is corrected and how they will behave structurally is a question to ponder, and surprisingly this is not at all given a thought! The problem gets compounded when the possession of the building changes hands with time. Each person will make some alteration and the structural framework will be a puzzle without an answer?! The various authorities should ensure that the structural plan and details of a particular building, at the time of getting possession (registration) and at disposal stage, should be compulsorily submitted by the seller, and the buyer also should be given the copies. To this end a statutory body of civil engineers empowered with enforcement (same rules and regulations) throughout India if formed, will be useful and purposeful. The Government also should heed the say of the body as final and supreme from the civil engineering point of view. This will enable the Government to save valuable resources during calamities.

The organisers of this E-Conference are to be commended for taking the initiative

to protect the image of civil engineering and for betterment of our countrymen, and providing a forum for exchange of valuable thoughts and suggestions. They have acted as per the following quote.

"Start by doing what is necessary, then what is possible, and suddenly you are doing the impossible". -St. Francis of Assisi.

Looking forward to further interaction.

Thanks for the wonderful opportunity.

K. Sivakumar,

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**Rajiv Sharma [Thu Aug 29 14:40:59 2002]**

Hello Vidyut:

This is about your suggestion.

*Mr. Vidyut Gandhi wrote*

*Regarding the quality at design level I want to suggest one thing. Why not the fresh engineers/graduate engineers should take the help of established & competent structural engineers like Shirish Patel (Bombay), VMS (Ahmedabad) & many more in designing the structures at conceptual level? Their drawings can bear the names of those leading engineers along with their own names. Leading engineers can get royalty out of this! Of course the liability lies with the engineers who take help from leading engineers.*

I think your suggestion is difficult to accept. A person who doesn't have enough experience to design a building should not accept such assignments. He should start his practice only when he has enough confidence and not before that. Such a person should engage himself with other consultants as a design engineer for several years before starting on his own.

However if he wishes to seek another engineer's advice that may be done only at personal level. Since the design fee of most of the leading engineers would be much higher a younger design professional may not be in a position to afford the costs of seeking their advice.

With best regards

Truly  
Rajiv Sharma

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**Rajiv Sharma [Thu Aug 29 14:43:01 2002]**

Hello Friends :

This is about solutions on some issues raised by Dr. Jain and a few messages recd. earlier. For your convenience I am giving it in question/answer format.  
Licensing of Structural Engineers:

Q. The issue before us is that what we gain by licensing and ultimately who benefits from it?

A. Society in general benefits by licensing of engineers. Keep in mind that there are engineer-bureaucrats, engineer-managers, engineer-businessman and so on. Not all are professional engineers. So a licensing procedure will go a long way in identifying professional engineers from the rest. If a professional engineer decides to leave his profession temporarily or permanently he must inform the licensing authority to see if he could retain his license. So the idea is that only those engineers who are active in profession can keep their license.

Q. What should be the process of licensing?

A. I feel that young /fresh engineers must work for a period of minimum 5 years before they can apply for their PE license. During their employment they should be guided by a senior engineer who has a PE license. After completing the formal 5 years training they should appear for an exam. where real life problems should be asked. Their exam. answer sheets should be reviewed by other PEs. When the young engineers meet the testing standards they should be given the PE status.

Q. Well it sounds good but what about other engineers who are already in practice?

A. It is not easy to formulate a magic formula which will satisfy all. However we have to start somewhere. An engineer who is in the profession for more than 15 years may be given license unconditionally provided he has actually worked in the area for which he is seeking license. Like a site engineer for 15 years should not be given a license for design engineering. Engineers who have not acquired that much experience should submit their designs and details of their past works. This can be examined by the licensing authorities and if they are felt competent enough they should be given PE titles.

Q. What about those who fail to qualify for their PE license?

A. Such persons can acquire license by appearing for exam. only.

Q. What about AMIE engineers ?

A. AMIE engineers should also appear for PE exam., if they don't qualify for their PE license by virtue of their experience.

Q. But similar licenses in other fields have not worked like take for example doctors and IMA.

A. True it has not worked because there is no will in IMA to take actions against quacks. However to make the licensing more effective it is essential that we have a quick system for redressal of grievances else everything will go in vain. We must have a system where dissatisfied clients can ask for justice. Licensing authorities must be empowered to punish the guilty.

Q. It may take lot of effort and time till we have such a system in place. What can be done now without out side help?

A. Quality is not a prisoner of any regulation. A better quality in design and construction can be achieved if we try to implement it. Everyone has a policeman inside him who gently knocks and tells what is wrong and what is right. Just wake him up and keep him alive.

Training of Young Engineers by Professional Engineers:

Dr. Jain has suggested that professional engineers should devote some time in training of younger people. It sounds good but is not so easy for the professional engineer. Where he can start from? It should be other way round. Young engineers should be given access to senior professionals where they can seek opinion of senior engineers on professional matters. (See Mr. Vidyut Gandhi's suggestion and my reply on that). It is certainly possible to keep aside some hours every month for young engineers and see if we can help them. They can come to seek professional help from senior engineers during those hours. Seismic Tests etc.

I feel that a PE exam. is the answer rather than only Seismic Engineering Test.

With best wishes

Truly  
Rajiv Sharma

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Shekhar Ghate [Thu Aug 29 14:43:04 2002]

Dear fellow Professionals

SORRY FOR JOINING LATE.

I congratulate Sudheer & Alpa for initiating the dialogue.

I think all of us r in agreement re ills in our civil & struct engg field. main problem is how to improve the current situation , knowing enormity of problem. how to begin , how to set the ball rolling.

following r some of my thoughts : I Internal problems:

- poor education . al r agreeing that there is no continuing education programs even in Metros , leave aside cities/towns. this can b definitely improved. 1 day seminars r not v. effective , more superficial & overview type. i was involved in organizing seminars thru Instt of Engrs 1 on earthquake & other on Seismic assessment & retrofiting. we should hv more indepth courses , atleast 4-5 sessions of 3 hrs each & partly class room type , partly interactive type. few months ago 1 course was organised by ISSE (Indian SOciety of Structural engrs) in Mumbai at V.J.T.I..on

Structural Steel Design . it was on 5 Fridays evening 5-8 p.m. totally 15 hrs. 5 diif faculties had come. we kept fees of only 750 Rs so that many would come by paying themselves & not sponsored by their companies. there were more than 45 participants. most of them were quite happy that they definitely learnt lot of new things. 1 expert talked on welding , (procedure , types ,inspection etc).

After spending more than 20 years in this field , i also learnt many things @ welding . as normally in civil works quality expectations r low compared to eqpt fabr , mech works. if we don't know then how can we specify in drgs/ tenders or supervise /extract at site? i remember referring 1 interesting book of proceeding of 1 similar 1week course on struct dynamics organized by M.I.T. for USA professional from industries way back in 1969-70 . course material is published as book & v. useful even now.Many contributors like Dr Biggs later wrote separate books.

we r planning series of such courses , each of 4-5 sessions of 3 hrs each , as part of C.E.P .e.g.

1.on comp usage in analysis & design : how to idealize & how not to, how to chk & then interpret results. (esp FEM results) incl solved examples.

2. on basic concrete technology; use of admixers, what to chk when designer goes to site, what is to b tested , & where

3. design & constr of special structures; bridges, marine struct etc

4. Struct dynamics: basics, earthquake analysis, eqpt fdns ,

5. Soil investigation : what to specify , chk/interpret soil report, effect on fdn design.

6 Pile Fdns : incl pile cap design , lateral capacity/ design.

I am sure there will b good response. only problem it takes lot of organising efforts & it is not easy to spare quality time while carrying out normal professional activities. All who wish to participate in organizing r welcome.

If ANY1 is having good course material we appeal to send the same.

About other issues i will post separately part 2.

Regards

Shekhar Ghate

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**Shekhar Ghate [Thu Aug 29 14:44:00 2002]**

Dear fellow Professionals

I wish to continue earlier dialogue.

2. External problems

a).To improve output & accountability of various other agencies mainly buider/ developeer, we hv started in a small way. , we hv taken initiative , formed a group jointly by BMC(Bombay Municipal Corp), WITH Insttn of En grs (Mharashtra state centre) , ISSE, Indian Inst of Arch(Mumbai centre), BAI ,PEATA etc. we r revising submission formats , introducing ISSE format for certificates to b submitted by Struct engr, Archtect, Supervisor,& above all builder/ developer.BMC has agreed in principle to revise the format. nitty-gritty r being worked out.

however i hv to admit , it is taking long time , some people from our fraternity r opposing some clauses .e.g. we hv suggested to carry out soil testing , submit

some calc ( not some sample calc) , insist on ductile det as per 13920, subm of det drgs., which some think is little too much for the fees being paid. we hv suggested better input from Arch , other agencies elect , fire fighting etc that layout & sizing r better , to hv min modif/breaking/chipping , maintenance problems at later date . once this goes thru it may b follwed at other municipl corp.

b) re nodal agency: is a must. but we must hv a body having legal status. w/out engr's bill how to hv 1? we don't hv pressure group. who will initiate this group. it has to be started by leading professionals, not by academicians from IITs . we hv many institutio/ associatio who work separately & sometimes having conflicting interests.

i am trying to bring atleast few insttn to work jointly. can Asso of consulting engr's take the lead.?

c) Regstrn as Professional engr. When BMC started paractce of registration of Struct engr , initially aspiant were screened by leading professionals. later on it was passed on to BMC. I think to begin with we can form a committee of experts who will approve & then the name gets in the BMC list. Insttn of engr's , ISSE can take lead FOR THIS. same can be followed for all other cities. Also registration shall be for separate area of specialization as suggested earlier . I request Mr Shirish Patel & other eminent professional to respond to this. if there is consensus , we can definitely take it up.

Regards

Shekhar Ghate

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**Narendra Pal Singh [Thu Aug 29 14:57:01 2002]**

Dear All

for implementation of project there is necessary to do the feasibility analysis of site project and the cost benefits analysis also with approved organisation.

narendra

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**Kiran Akella [Thu Aug 29 14:57:04 2002]**

My greetings to all the conference participants.

The initiatives proposed by the moderators at the end of the third day were

thought provoking. Adding another institution to the many existing will not be a solution at all. A movement is required to achieve the goals through proactive attempts by practising engineers working in small towns and cities with a few years experience like some of us involved in this conference. Only then would it be able to encompass the vastness of our country. Something quite similar to Gandhiji's Satyagraha movement, but since he showed us the way once, this time we have to manage without him. The best outcome of this conference may not be establishing another organisation, but starting such a movement.

The suggestions for conducting tests to license or evaluate structural engineers may require some extra thought. The more preferable strategy may be based on the experience profile of the applicant. It should be similar to the way a visa or immigration to a foreign country is procured. There could be points for each type of project undertaken and type of work done. Weights could be given for the work done depending on its complexity. A person with a tally exceeding a certain number of points can be given a special license. The applicant should show proper evidence for the work that he is claiming points. Conducting exams is surely a simpler way but it would only lead to people studying to clear the exams and may not ensure that we become better structural engineers.

with warm regards,  
Kiran Akella

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**Alpa Sheth [Thu Aug 29 14:58:01 2002]**

Dear All,

In continuation with the "small" steps one can initiate to improve the present scenario,

a) Taking engineering issues to the lay person. It would be nice if we could come up with a small booklet "How to buy a house" We could educate the prospective buyer in looking at various issues while buying a house- Legal, architectural, planning but more importantly from our point, the issues of good engineering. We may not want to make it very complicated but outline basic engineering features to be looked at while selecting a home. We need to impress on the buyer that unless the basic skeleton is healthy, any kind of good architecture is only cosmetic. Such a book could be funded and distributed by housing load agencies. For improving structural engineering standards in our country, a demand based initiative can work as a big catalyst.

b) Prepare a booklet for architects educating them about Basic engineering issues to be considered while planning and enlighten them about code requirements-

such as min width of column, recommended beam and column width-depth ratios as per IS 13920 and so on. Perhaps PEATA and other such organisations could be drafted into helping in this.

c) Guideline booklets for Masons- A lot of work has been done on this in states such as Gujarat (and Uttaranchal) post-earthquake and the state authorities there may be contacted for allowing for its wider distribution.

d) Establish a website which can be a resource data base having information on all "indigenous" books/guidelines/training courses/research work/capacity building projects. It is today easier to find out what is being done internationally than in India. NICEE is already doing some work in this regard.

Alpa

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**Dhirendra Tripathi [Thu Aug 29 15:00:02 2002]**

Namaste All,

In the aftermath of the Gujarat quake I did observe how the building industry functions internally.

One reason why inadequate structural design and implementation is so rampant is that to a great extent new construction is quite similar to existing structures. This has the following consequences :

1. The average builder regards the structural engineer to be someone who merely copies an older set of drawings with minor modification. Stamps them for due compliance and submits them. Evidently he doesn't regard this as a lot of work and tends to pay very small amounts.
2. The structural engineers who have reconciled themselves to this system seem to accept the lower amount of money cause it meant less amount of work, and they try to make up by doing more number of assignments in a given amount of time. Their basic knowledge stagnates and their ability to attack fresh assignments from first principles atrophies. Any knowledge upgradation becomes a herculean task.
3. Once a structurally inadequate design finds favour ( possibly because it leads to cost benefits ). It tends to replicate itself and soon an isolated case becomes a rampant disease.

So what is the solution? Some things that come to mind are :

1. As many emails suggest there is a need to make the community more vibrant say by having journals so that even if apparently similar structures are being designed by architects there are always new innovations being introduced by structural engineers.
2. If licensing is implemented structural engineers should be required to renew the license every 5 years or so, to make sure their knowledge / skill remains at acceptable levels.
3. The industry needs to be more vibrant. It should have greater interaction with allied engineering fields and raw material manufacturers to make innovation and novelty a norm rather than an exception. For instance like others the building industry is majorly affected by costs. As of now chances are if a good structural engineer is retained, the fees shall be high AND the cost of implementing the structure designed would be high. Now if the structural engineers can come up with innovations that reduce cost of construction without compromising on safety they would win greater respect faster than by any other method. So cost reduction can be a thrust area for research.

regards,

Dhirendra Tripathi

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**Rajendra Raut [Thu Aug 29 15:14:02 2002]**

Thanks to Dr.Sh.SKJ for providing discussion on professional issues in INDIA.

It is accepted that there is need for institutional set-up in India for active engineering community. We know existance of various institutions govt & private across the country still mega-projects, projects financed by World bank etc .goes to Foreign Consultants. There is point to see why? Money out?

Here i have to say something for future institution/council.

1.0 The Engineering Council desired:

- Institution should have set- objectives/goals in various engineering areas e.g. Buildings, Industries, Offshore etc.
- Providing training, opportunities for members in research/projects, open seminars, regulations of codes, cost\_saving factors in design, design strength, contractibility, reliability, and aesthetics in the solution of a civil or structural engineering problem.
- Institution shall have independant business plan, service products &

financial base.

- Preparing action plans for Continuing Professional Development of personal qualities - knowledge/skill distribution of responsibilities among members in order to achieve desired goals.

- The licensing process, membership, working of institution should be transparent and 100% Corruption free.

## 2.0 Functions

- Selection of regulating/council members, selection criteria under democratic fashion.

- Creating awareness through good practice in construction, QA, engg, cost-saving, strength requirements etc to end user.

- Ensuring feedback system from society to know performance of institution & services offered.

- Developing standards to civil engineering problems/solution in the event of quake, cyclone etc

- New Law/policies shall be prepared to meet objectives & effective monitoring functions at all levels.

- Acceptance to change for growing needs of technology, competitive environment - others institutions & social demands.

regards

RAJENDRA RAUT

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### B. Ghosh [Thu Aug 29 15:42:00 2002]

Hello,

This is Barnali Ghosh from Cambridge University, researching on soil structure interaction for building during seismic shaking by physical modelling (Centrifuge). It's interesting that many people have commented on the level of education in our engineering colleges (apart from IIT and IISc). I have come from one of the sub-standard government colleges in Bihar and feel strongly that in most of these colleges the syllabus is strongly outdated and old. Most of the teachers cling to their old notes from the seventies which have seen many springs. In these environments students score very well in exams but hardly have proper understanding of the subjects. We need to have a "thinking" academic environment in all the colleges, not just in the pristine colleges if we want to think about the future of the profession as a whole. Secondly, there was an idea floated that it will be a good idea to let young engineers meet once in a year in a friendly environment so that they can share their work experience. Recently in UK we had the chance to attend the young geotechnical engineers symposium in Dundee. This event was organised by the British Geotechnical Society and brought all the young researchers and engineers

working in the industry together on a common platform. It was a fantastic opportunity to interact in an informal environment. Such events should be encouraged in India as well.

regards  
barnali

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**Narendra Pal Singh [Thu Aug 29 15:43:01 2002]**

Dear All

In continuation of small steps there is also need of following thing

1 Training at the Grass root level , when we say that the guideline for masons, there is a need of training to masons at grass root level, UNDP-Bhuj trained around 2000 masons in seismic safety and retrofitting techniques, these trained masons now aware about seismic safety requirement. The training required not to train the masons but also to aware the masons about their responsibility towards the construction process.

2 Documentation of Works In the global changing of world its required a proper documentation, so we can compare the structural changes and the share the innovative new technology.

narendra pal singh

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**Suryanarayana Saripalli [Thu Aug 29 15:58:00 2002]**

Dear fellow engineers/PROFESSORS/OTHER FETERNETY INCLUDING ARCHITECTS. WE ARE ALL IN THE SAME BUSINESS, AND ARE INTER-DEPENDENT WHAT WE AS A BODY NEED TO DO NOW IS

1] GROUP UP -FORM INTERIUM ADHOCK COMITTE AND ASK FOR GOVERNMENT TO MAKE A LEGISLATION IN THE MODELS OF COMPANY SECRETARY-ASSOCIATION [SO THAT LEGALLY THIS BECOMES THE SOURCE FOR -LICENCING-MEMBERSHIP-FELLOWSHIP-FOR GOVT,PRIVATE,PRACTICING INDIVIDUALS] THIS ASSOSIATION ALSO TAKES UP DETACHMENT OF PRACTICING LICENCE FOR ALL INCASE OF ESTABLISHED COMPLAINTS.

2]SET UP ACOORDINATION COMMITTEE A]TO REGISTER ALL OTHER ASSOCIATIONS IN THE FIELD.B]TO TAKE REVIEW OF ALL IS/ISO/ASTM/BS/RELEVENT CODES INRELATION TO INDIAN CONDITIONSC]SET-UP ARESERCH INSTITUTE-WITH FUNDING FROM

TATAS-RELIANCE-GAMMONS-AFCONS-ESSAR-Etc., TO MONITOR FOR FIVE YEARS SOIL MOBILITY, WATER LEVELS, WIND AND OTHER FORCES COMPARABLE TO FLORIDA-OKLAHOMA-SEATTLE AND EVOLVE CHANGES IN STRUCTURAL/FOUNDATION CODES/MATERIAL CODES.

THANKS  
SURYA.N.S.

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**Rakesh Singla & Dinesh Kumar Singh [Thu Aug 29 16:20:01 2002]**

Helo everybody,

There is a lot of discussion going on structural design of buildings and licensing to the profession. Along with these aspects, we all are not paying due attention to the soil investigation aspect which I feel, is also equally important as structural design.

In recent past and earlier earthquakes we have noticed that major of the casualties are because of poor foundation which were designed without considering actual soil investigations. In my opinion there must be rules laid down for proper soil investigation for buildings of G+2 (atleast) and above and shall be designed as per IS codes.

With warm regards,

Rakesh Singla & Dinesh Kumar Singh

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**S. Bhattacharya [Thu Aug 29 16:26:01 2002]**

This is again Subhamoy Bhattacharya

Dear Fellow professionals

I feel there are some courses which is a must for all structural Engineers. If the student does not pass the course with a certain marks, he may not be permitted to design important structures like HOSPITALS, BRIDGES, DAMS etc. In my opinion it should include

1) Collapse mechanism of structures. I mean ultimate load the structure can carry. It should contain UPPER BOUND AND LOWER BOUND THEOREM of plasticity. Given the description of structure i.e. dimensions, material, stiffness he or she should be able to quantify what lateral load or axial will form a mechanism.

2) Stability of structure or crudely BUCKLING INSTABILITY. What is the importance of P-delta and where to be considered. Effects of shear, imperfection forces in buckling.

3) Ductility in design--- why important and how do we cope with it.

4) How is earthquake force transferred in a structure, ground motion to ..... and how does code deal with it.

5) Lastly, in the curriculum he or she should analyse atleast one real failure of structure during earthquake. I can give you an example-- say well known tilting of Kandla port tower building--- the building is structurally allright and appears no damage from outside. The foundation tilted. What is the pile length and what is the soil deposit (Get data from literature or ask the authority). What is the load in a typical pile? Did the soil liquefy beneath? What the pile may have done--- formed a hinge at top. Calculate the collapse load of the pile.

I am analysed 15 case histories of pile foundation mostly in earthquakes of Niigata (1964) and Kobe (1995) where sufficient data are available. It is thrilling to note what factors are crucial. It is available in my website [www2.eng.cam.ac.uk/~sb353/YGES2002.pdf](http://www2.eng.cam.ac.uk/~sb353/YGES2002.pdf)

Regards  
Subhamoy Bhattacharya

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**Datta Kare [Thu Aug 29 17:06:01 2002]**

Dear Mr. Mahmood,

Please ref my mails on similar lines and the reply discussion from Mr. Arvind Jaiswal.

Datta Kare

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**Datta Kare [Thu Aug 29 17:06:05 2002]**

Dear Mr Arvind Jaiswal,

In the issue of Architecture issue June 2002 (The magazine of the Council of Architecture, India) I also read an hileted article on page 15. I reproduce " NBC (2nd revision 1983) recommends practice of profession of architecture by engineers and supervisor too and this is violation with the provisions of Architects Act 1972"

The preamble of Architects Act clearly states as follows "Act only protects the title of "Architect" but does not make the design, supervision and construction of buildings as an exclusive responsibility of Architects. Other professionals like Engineers will be free to engage themselves in their normal vocation in respect of building construction works provided that they do not style themselves as architects."

Is COA ignorant about the spirit of Architects Act 1972? I think all concerned bodies of Engineers should inform BIS about the spirit of Architects Act 1972 and contempt of various court rulings for NBC's 2nd revision.

Datta Kare

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**Saisubramanian [Thu Aug 29 17:36:01 2002]**

Dear all:

In this conference i would like to place few suggestions to improve and standardize the construction and its cost. for this Purpose i would like to cite an example. 1.All said and done , civil engineering has not emphasized on the introduction of technological advancements to claim status.for example, in many places when surveying is to be done, most institutes still do with dumpy levels and the engineers are in the age old methods.In filed we have total stations and lot of scope for GIS application.On the other hand if we look at the mechanical engineering, we have cars that have MPI and catalytic converters.the market is flooded with several versions of cars, each carrying a price tag that goes unquestioned. Can anyone say civil engineers would also be able to exhibit similar variations that a common man would appreciate.I refer to possible standards for utilities .IN short i feel the academicians should review the curriculum to make more advanced in terms of introduction of modern instruments and extensive computerization.Govt can make in turn help boost use of new construction materials and concreting practice like rmc. And employers , perhaps to start with, should recognize that fact that civil engineers are creating assets which in the long run remains as symbol of civilization.Petronas tower in malaysia, for ex.r and the classic road construction by romans all speak mighty civilization of mankind.Certainly, all civil engineers need to be given a better place. pl.pay decently and price your products competitively. let us redefine the status of civil engineers.

regards, saisubramanian.

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**P.K. Singh [Thu Aug 29 18:29:01 2002]**

Dear Dr. Sudhir Jain

Please refer to the views expressed by Mr. Arvind Jaiswal on the role of ECI. I would like to share following information with all of you.

1. On the role of associations of engineers

ECI is thinking in terms of involving organisations/ societies already functioning in India in various discipline for implementing the formal licensing system/ granting status of professional engineers to practicing engineers. Some of the issues that this committee is grappling with are:

- a) There are associations who are involved in more than one branch of engineering, for example IE(I) has members belonging to Civil, Mechanical, Electrical, Chemical etc.
- b) For any particular branch of engineering, there are more than one association.
- c) Some branches of engineering are treated as sub-branch of a main branch of engineering, for example. structural engineering is treated as a part of civil engineering; telecommunication as a part of electronics, oil and petroleum technology as part of Chemical Engineering.
- d) This leads to the questions on what all branches or sub branches one has to take into consideration for granting license/professional engineer status and how to handle claims and counter claims of various associations.
- e) And finally, as we all are aware that there are some associations who are essentially association of contractors masquerading as association of engineers, and than there are other associations whose main function is to organize seminars and workshop for raising funds.  
The question is how deal with their claims.

The Committee set up by ECI to deal with the subject is looking for satisfactory answers to these questions.

2. On Engineers Bill

- a) ECI has constituted another committee to prepare a draft Engineers Bill. It is drawing upon the earlier drafts prepared by IE(I), Association of Consulting

Engineers and the bills in force in countries like Singapore, U.K., Canada.

b) I am afraid, the Committee set up by ECI is not looking into the issue of fees and salary structure, at the moment. The issues being discussed by it are on the definition of a professional engineer, its ambit, frame work for regulatory and implementing authorities. I personally think that Engineers Bill should not address the commercial issues of fee and salaries, as these would eventually be determined by market forces and not by any statutory dictate. As far as I know, amongst the bills regulating professionals, only the Architects Bill insist on a fee structure and we all know the fate of such a stipulation. However, I would put the contents of the email from Mr. Arvind Jaiswal before the Committee on Engineers Bill for their consideration.

And lastly, I must make it clear that these are my personal views and need not reflect the official views of the ECI. However, in case any one of you has any specific query, I would be glad to attend to that.

Regards,

(P.K. Singh)  
Director, ECI

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**Suren Vakil [Thu Aug 29 20:13:01 2002]**

Dear All,

I am impressed by the shear volume and quality of many of the e-mails. Some points.

A number of buildings that collapsed in Ahmedabad (and many that did not) are designed by a very small number of structural consultants.

(I will not name them !!) I support the witch hunt...I just wish that they were still in jail. In fact my office is on the 8th floor of a 10 storey building which survived the shaking (and I was in it at the time !!). The quality of the design and the detailing is abysymal and was carried out for the princely sum of Rs 10,000. Subsequently we constructed a STAAD model of the building after studying the drawings and concluded that the main reason why the building was standing was due to cross walls which had not been designed and perhaps redistribution of loads. In any case it could quite easily have collapsed and I do believe that both the engineer and builder should be locked up for life.

We then decided to look for a properly designed building in Ahmedabad but could not find any after looking at many buildings. Sorry we did find just one,

but the plans revealed that one storey was illegal so we were faced with a new quandary. We have not yet moved !!

Basically the entire system needs an overhaul and we are optimistic that this will happen.

My suggestions for improving the profession are as follows :

a.. I have seen the UK Chartered Engineer system and I feel that it is good model although improvements can be made. In the UK civil engineers follow an approved training programme over 3 to 5 years which includes design office and site work and are tested by senior members of the profession. It is totally "clean" and gaining membership of UK Institution of Civil Engineers is a career milestone. The combination of site and design experience combined with attendance on courses and testing of communication skills gives good results. A Chartered engineer has a solid standing in the UK. (although they still complain!)

b.. Licensing of engineers is different from attainment of professional qualifications. We need both and I agree with Alpa with regard to licensing. All I would add is that engineers who wish to be licensed must first gain professional qualifications ie become Chartered through the route outlined above.

c.. Most concerns, contractors, consultants etc are family run where advancement can be more dependent on genetics as opposed to ability. Our engineers need to work in professionally run companies where they can aspire to shares in the company and a place on the board of directors, L&T is a good example of a meritocracy. It must, however, be a truly demoralising experience to work in places where the owners offspring or relatives with no technical qualifications automatically manage the company. Professionalism springs from a sense of ownership and responsibility. So my advice to engineers who are performing well is...do not ask for a pay rise...ask for shares in your company, if enough people do this, the system will change and the rewards will be spread better.

d.. Finally improving the standing of engineers depends upon improving the quality of engineers entering the profession. I have interviewed engineers with masters degrees in structural engineering who were having difficulties drawing simple BM & SF diagrams at interviews. Frightening but true !!

Suren Vakil

MD  
Babtie India

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**Pankaj Gupta [Thu Aug 29 21:16:00 2002]**

Dear Colleagues,

In 2 of my previous emails I had underlined the problems facing our practical professional environment, but as we are nearing the end of the E-conference I would like to offer an attempt at the solutions as below, which are primarily economic.

#### 1. Ethics

For the basic problem of ethics, I do not have any solution, except an advise to the ethical that they should stick to their guns, and that it pays in the long run. The unethical will always undercut & give poor quality product, and it is upto the client to determine what he wants, but neither can you wish away the existence of the unethical, nor can you hope to have such a governing system that they get punished for being unethical. There is a range of clientele for the whole range of fees. People moonlighting for less than Rs 1/sft also get work, and those working at Rs 10/sft also get work. If you give a quality product at a higher price, you will always find a clientele for that, provided you DO provide quality worth that (or at least make it seem so). I think that this is a basic economic principle.

#### 2. Demand & Supply

It is well recognized that in our profession the fee structure has degenerated to its nadir, and the primary cause being too much supply, and too little demand, and this in turn is the primary cause of all the evils which we want to mitigate. To reduce the supply, as some people have suggested (like finishing off with seats for Civil in Engg. Colleges) is both shortsighted & harmful. So how to raise the demand. The demand will rise

A) By a kickstart in the economy of this country, which is not in our hands, so we can only wait for that to happen. But there is something we can do & is in our hands and that is

B) Venture outside India. The internet has made it possible. Instantaneous, Low cost & High volume data transfer through the Internet has made it possible to get Overseas projects. The situation in US, UK & other western nations is the reverse, that there the demand exceeds the supply. A few years back they used to import people to bridge that gap. But now the concept of outsourcing the work to low

manpower cost countries like India is catching up. It solves both their problems as well as ours.

I started with this concept in the year 2000, started with structural detailing (to get acquainted with their methodology, techniques, codes & standards, materials etc) and now have entered into hard core design. From 1990 to 2000, it was difficult for me to support 2 or 3 employees beside me (specially with my habit of arguing & quitting), but from 2000 to now we have become a 35 strong company, with a growth rate of over 250% per year. We will be opening office in US within this year. Why worry about multinationals coming to India, and taking our work (as some people had complained)? Lets beat them at their own game, and benefit ourselves, and our economy in the process.

This will remove the excess of demand, which will automatically correct the fee structure, and remove the associated evils. Since now I get my bread in \$s, now I have the luxury of doing only those local projects, which I find interesting and has a proper fee structure. I reject any work beforehand, in which I smell anything fishy.

I know this post will make some so called socialists, communists, nationalists etc....etc....smell fish all over, but I hope it will make sense to some people. I do not know, why it is so difficult to learn, digest and accept that "THERE IS NEVER A POLITICAL SOLUTION TO A PRIMARILY ECONOMIC PROBLEM". I for one believe that the problems facing us is economic, and only economic solutions will solve the problem.

Once again sorry for this long post, but I think this is my last. And if anybody would be interested in some advise on how to go about getting work from abroad is welcome to write to me privately, so as not clog this list/econf.

Regards

Pankaj Gupta

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**Arvind Jaiswal [Thu Aug 29 21:16:04 2002]**

Dear Sri Kare,

Thanks for a valuable input, I will try to inform this to ECI and Sri Mahendra Raj who is actively involved in Engineer's Bill.

With warm ragards....Arvind

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**Arvind Jaiswal [Thu Aug 29 21:53:01 2002]**

Dear Sri. P. K. Singh and Dr Sudhir Jain,

Thanks for your kind and though provoking mail and raising the basic issues.

I will certainly try to reply them with a little leasure, as these points need enough debate and related information.

Regarding the fee, I am of the opinion, that it must be specified. The fee structure by Architects Act is not a total failure. The fee structure with Government Projects are reasonably linked to COA guidelines and they are improving day by day. Only the sector is not complying is Builder's segment and Private bodies. But just because one or more than one bodies are not falling in the line we should never forget to enclose what could be the possible healthy professional fee structure.(I am not including salaries as it is altogether a different topic and even Architect's Act does not try to address tha same issue) ECI then should leave to the individuals to collect it. But ECI will certainly play a very healthy role in issuing the fee structure to Government Organisations through Ministry of Urban development after the Engineer's Bill is passed. It will be the onus of the different state government and Central Government departments to follow the same.

In case ECI does not take up the issue of Professional fees structure, then whatever a litle hope of getting better fees is lost automatically, and it cannot be enforced at a later stage.

With warm regards.....Arvind

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**Adityam Krovvidi [Thu Aug 29 23:02:01 2002]**

Dear friends:

At the outset, we congratulate and thank Prof. Jain and his team for organizing such a wonderful conference on a subject close to our hearts. Inspired by the overwhelming response to the initiative we've run a parallel discussion internally and reached some conclusions which we'd like to share with all of you as given below. We hope you'd find them useful.

#### **ROLE OF STRUCTURAL ENGINEER IN DISASTER MITIGATION**

The role and responsibility of structural engineer (SE) are being over-emphasized against the backdrop of disasters like Ahmedabad. We believe that SE has a limited, albeit important, role to play in mitigating/preventing the disasters even

if we institutionalize the suggested mechanisms like IIStructE, licensing, etc. His/her role usually ends with producing structurally-sound specifications and drawings. The translation of these specifications to ground truth is the weakest link in the chain and will continue to be responsible for translating a hazard into a disaster. Enforcement of codes, standards and regulations is the KEY to any successful disaster mitigation/prevention program. Our internal discussion is mostly centered around this aspect and some of the ideas that emerged are attempting to reduce this gap in enforcement.

## ROLE OF THE PROFESSIONAL INSTITUTION

The strategic intent behind any initiative on structural engineering profession should include SAFETY as the first and foremost aspect. The vision statement of IStructE, London, emphasizes safety, efficiency and excellence. We strongly agree with the proposals of a professional body like IIStructE and licensing of structural engineers in principle. Notwithstanding the legal support it may or may not enjoy the institution should promote its cause primarily in a two-pronged approach given below. The former aims at addressing people - the professionals and the later at reducing the enforcement gap.

1) Licensing practicing structural engineers with various levels (say L1, L2, L3, etc.) based on some distinct suitability criteria for each level. Let's call them as Chartered Engineers (CE). Development of CEs is a top-down approach through institutional mechanism. CEs are "agents of change" to realize the envisioned status for structural engineering profession. 2) Certifying buildings on a rating scale (say C1, C2, C3, etc.) based on some structural safety and quality criteria. A technical audit by a team of CEs could be a good idea to achieve this. In case of existing buildings the certification can help a retrofitting program by certifying and recertifying in before & after scenarios respectively. In case of new buildings the certification will be readily accepted by reputed builders for marketing advantage. The certification will also help correcting the market value of buildings by distinguishing good from the bad. Today the market values are largely driven by non-technical factors like location and demand/supply without any regard to safety.

The key to success lies in building the Brand. This is similar to the CMM certification for software companies. Other examples to draw inspiration are: rating agencies - Standard & Poor, Moody's. It goes a long way to achieve the status accepted throughout the country. However, at some point the governments (national or state) may recognize IIStructE as an agency to carry out their agenda of disaster mitigation and provide the required legal support which will help achieve our goal in a short time.

## REPORT OF HPC ON DISASTER MANAGEMENT

We need to develop strong linkages with developments on disaster management. The High Powered Committee on Disaster Management (set up under the Prime Minister's initiative) laid out recommendations that include licensing of engineers and architects, retrofitting of existing structures and evolving a scheme of reward & punishment for prevention/mitigation activities. One important observation is that there is no explicit mention or emphasis on the role of structural engineer in its recommendations although structural measures were detailed for preparedness. This strengthens our understanding of the limited role of SE, at least in the present scenario. There are non-structural measures as well - for example, insurance with policy structures involving incentives and disincentives.

We need to do something proactively to align our agenda with this national strategy and become champions to help implement it. This way we can achieve our goals sooner than later.

## WIDER CONSENSUS

We suggest the present discussion be continued on a formal platform (national conference/workshop) involving all stake holders including key structural engineering professionals from industry, academia, R&D institutions and disaster management agencies. The ideas and issues need to be discussed further and concrete action items with time-frame need to be laid out.

Wish you all the best!!!

Adityam, Simon, Prasad

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**Anuj Sangal [Thu Aug 29 23:05:01 2002]**

Gentlemen,

I would divide my emails in several sections to keep them small and readable:

1. Education: it is important that every engineering college should adopt a common basic course (whether IITs or RECs or others) which inculcate theoretical and practical aspects of civil engineering. It must include proper planning, designing, detailing of structures. I must say that even IIT graduates lack practical aspects of civil engineering. Structural engineers must not forget that every building and structure is multidisciplinary (i.e. involving other civil fields and engineering like HVAC, fire fighting, earthing, electrical etc.) for which appreciation should be developed. In my opinion there should a SYSTEM OF GRADATION OF COLLEGES so that every would-be student knows the

standing of the college.

2. Training: To avoid 'Chalta Hai' and 'Aise Hi Hota Hai' culture, it must be made mandatory by statutory law that every organisation (Pvt. Or Govt.) must recruit at least one fresh graduate for two years with a minimum fixed salary. Even professors should be asked to keep in touch with industry. National, state level organisation and municipality engineers should be sent for training once in two years. These approvers-of-the-design should be asked to prepare designs of various structure during training, which should be scrutinised by a panel of civil engineers (not just structural engineers) for their planning, design and detailing.

Anuj Sangal

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**Chitra Javdekar [Thu Aug 29 23:09:01 2002]**

Hello All:

Everyone is asking for some Governmental Regulation/Bill and regulatory Body. But the basic issue is that the profession has its share of Black Sheep. One of the posts by Roark Consultants was that in his case the builder found someone else to design the structure to his 'structured specifications'.

The main professional competence problem concerns buildings for housing mostly done in the private sectors. These will ensure better end product for the customer who is no more an investor but is mostly the end user nowadays.

I received some feedback/ideas from others well known in the field and therefore elaborating on my suggestions regarding role of financial institutions, I'd suggest that

- \* The Financing/Mortgage Institutions e.g. HDFC, ICICI, SBI Home finance
- \* General Insurance Companies that insure buildings
- \* Banks and other lending bodies who grant loans against housing/buildings

can be encouraged to seek a SIGNED AFFIDAVIT from the structural designer, clear documentation/records regarding:

1. BIS codes adopted for the design and drawings of the foundations and the structures
2. Design loads and other assumptions

3. BIS codes adopted for the structural materials ( cement, concrete, steel, wood etc . )
4. Standards for testing & acceptance of all structural work, including the foundations
5. Other Job-specific special precautions advised during construction

They can also seek an affidavit from the Architect who certifies 'Commencement & Completion' stating that these have been duly observed.

These institutions can insist that for major jobs the designs are "Proof Checked" by engineering educational institutions Government and semi Government bodies in Mumbai have done this in past with IIT Mumbai, VJTI Mumbai, CBRI.

All these certifications will be available to the buyers and the societies for future structural audit (mandatory in Maharashtra now after 15 years).

Thanks

Chitra N. Javdekar

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**S C Ghatе [Thu Aug 29 23:32:01 2002]**

Mr Sivakumar's suggestion is right. re documents to b handed over to final buyer. In fact BMC ( Bombay municipal corpo. ) IS THINKING in that dirn. it is recommended to hand over certain documents like struct drgs, arch drgs compulsory to society. we need to educate common buyer to insist on this.

Shekhar Ghate.

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**S C Ghatе [Thu Aug 29 23:36:00 2002]**

Dear Alpa

re registration issue of individuals and firms, in case of issue of stability certificate firm can give stability certificate on firms letter head signed by individual employee who is registered engineer. If that employee leave half way then another employee of the same firm can sign. i.e. MIDC accepts above procedure. The signing fellow is chartered engineer , member of Institute of Engineer. I donot know whether it is accepted by BMC.

Now stability certificate mentions that work is supervised by signing engineer and work is carried out as per his drawings (approved) prepared by him . In reality how many engineers supervised work, have their own full time supervisors posted at site. How can we certify the work not supervised by us?

Then why most of us are signing stability certificate when no control on actual construction? Either we should change the stability certificate format or insist having atleast some say on site execution.

Regards

Shekhar Ghate

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