

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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Proceedings:: Day 5

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Arvind Jaiswal [Fri Aug 30 00:05:01 2002]

Dear Sri Gupta,

I like the spirit behind

"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."

With warm regards.....Arvind

Arvind [Fri Aug 30 00:06:59 2002]

Dear Dharendra Tripathi,

Your comment:

" 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."

You are right about this but all countries give lifetime licensing to you, by virtue of your educational qualification (which is your life time achievement!) and experience criteria, with a condition that it has to be revalidated every 5 years or so, by personal interviews and aptitude tests, just to keep you on toe and not to misuse the same and keeping you to be update in your subject!

Your comment about "Cost Reduction" I would like to with CAUTION as this is one of the major culprits which was responsible for the Ahmedabad episode. Instead I would propose "Cost for achieving durable and functional Structure"

With warm regards.....Arvind

Arvind [Fri Aug 30 00:07:03 2002]

Dear Dr Sudhir Jain,

Your small goals are really facinating and achievable!

With warm regards.....Arvind

Arvind [Fri Aug 30 00:07:06 2002]

Dear Rajeev,

I remember the period for fresh engineer to complete as apprentice was originally proposed as 7 years!

Another suggestion, No one should be given license unconditionally in any circumstances, it should be only after veryfying laid down norms.

"Dr. Jain has suggested that professional engineers should devote some time in training of younger people."

My comment:

It is true that younger generation are future and we should invest in them, but the costs also have to be taken into account, and the affort cannot be

responsibility of only self declared ones, but should come from all engineering fraternity as their payback to the society from here they have risen to the present status.

With warm regards.....Arvind

Arvind Jaiswal [Fri Aug 30 00:08:00 2002]

Dear Chitra Javdekar,

I will love to know the details, please.

With warm regards.....Arvind

Arvind Jaiswal [Fri Aug 30 00:08:03 2002]

Dear Alpa Sheth,

Municipal Corporation of Hyderabad has already registered various firms for licencing as suggested by you. Another comment by you "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"

needs a little caution in a sense - where are "Professional Engineers?" Till the "Engineer's Bill" is passed no engineer is recognised, let alone calling one "professional" - LEGALLY I mean!!

With warm regards.....Arvind

Arvind Jaiswal [Fri Aug 30 00:08:07 2002]

Dear Rajeev,

" 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 & competant structural engineers like Shirish patel (bombay), VMS (ahmedabad) & many more in designing the stuctures at conceptual level ? Their drawings can bear the names of those leading engineers alongwith 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."

Very dangerous suggestion indeed and I agree with you that this should and

should not be resorted to at any stage of time.

With warm regards.....Arvind

Arvind Jaiswal [Fri Aug 30 00:08:10 2002]

Dear Jitendra Bothra,

Nice to hear from you again after the first e-conf.

Your comment:

"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"

I would like to give you a background on this Engineer's Bill.

Since 10 years Association of Consulting Engineers under the leadership of Sri Mahendra Raj was fighting with Government of India with a Writ filed in Supreme Court of India and this writ was in favour of Engineers Bill. Association wanted Supreme Court to direct the Government of India to take up the "Engineers Bill". Unfortunately this did not happen for so many years and the case was dismissed in favor of Government of India.

Now after the Bhuj Earthquake, Government of India took a very positive step to take up the "Engineers' Bill". But this could not happen as most of the Engineering Institutes were not willing to compromise and come to a common platform, hance it was decided to form the Engineering Council of India first and then bring all the Associations under one umbrella and make them sit and accept and achieve one common goal.

This step has also been achieved very nicely. Now ECI is trying to study earlier proposed Engineer's Bill and formulate a final proposal. This may take some time but it is not at all difficult.

We all feel very much excited by the recent events and see that it may be possible for us to have a bill in near future.

What is required - more and more awareness among the fellow engineers, mobilisation of opinions and forwarding same to the political parties. It is an accepted fact that politicians value mandate and public opinion! This is what we need and we are sure we will get it.

Regarding Nepal model I would not like to comment as it ruled by Monarch and not by parliament, hence differences are bound to be there, and every country will have starting trouble during implimentation stages, and we should be prepared for it.

With warm regards.....Arvind

Alpa Sheth [Fri Aug 30 08:41:01 2002]

Dear All

We have had a whole lot of very good suggestions regarding small beginnings that could be made.

It is heartening to note that many people are already involved in issues of training and committees and some have already been conducting small initiatives in their own parts of the country and are sharing them with us.

Some thoughts:

a) Training of Engineers : It would be beneficial to conduct a Training Needs assessment and identify what courses are most needed to be conducted across the country (such as earthquake course, a geotechnical course and so on) in continuing education programs to bring our engineers to capacity. As has been brought out, several academic institutions and professional bodies have been conducting training programs. However, we need a lot more continuing education activity. For introductory courses, one could perhaps prepare training modules (via Power Point presentations, Videos and so on), which can be distributed all over the country.- Professionals can prepare modules while in their own home or office and perhaps help in conducting the first one. Local chapters of ACCE(I), ICI, ISSE, IE(I), etc could then take over. For specialized courses, the existing mechanism (at resource institutes and colleges) can still be retained.

b) Conferences, Camps and Workshops: As has been suggested, there should be more workshops and conferences to discuss technical issues on specific subjects and also build the fraternity. Also, annual camps for younger professionals conducted over several years can prove very effective in the long run. A good example is the summer camp for civil engineering students at IITK for the last two years: details at <http://home.iitk.ac.in/~cvmr>. Will some organization volunteer to undertake a similar camp for the young structural engineers? e-conferences are a very effective communication means as is evident by the present one. Which means we should discuss the possible topic and dates for the

next one before the end of this e-conf!!! And perhaps someone (other than NICEE) can volunteer to host it. Someone could also volunteer to organize e-committees to formulate specific proposals and documents on professional matters.

c) Licensing of Engineers There was wonderful feedback today on this. Mr Rajeev Sharma, Mr. P K Singh, Mr. Suren Vakil and others have spelt out some finer points of licensing. These need to be debated more vigorously.

d) Professional Practice as Consultants As Mr. Arvind Jaiswal and others have discussed, we need to strengthen and consolidate our position vis-a-vis the architects and ensure that we are allowed to continue functioning as prime consultants on projects. A lot of work, it seems, is already being done by some of the professional bodies in this matter. We would welcome some more input on the present status and what more needs to be done to consolidate our rights.

e) Mentorship We would appreciate if senior professionals on this e-conf come forward and volunteer to keep aside some hours every month for young engineers and offer their help and guidance to them.

f) Upgradation of Teaching Institutes India has a very large number of engineering colleges. But, shocking as it may seem, too few of engineering colleges are up to capacity. Upgradation of such colleges is a huge task and needs to be taken up at the government level. However, we can still make tremendous contributions at our level through a variety of ways: delivering lectures on real-life projects, sometimes teaching full courses, guiding projects, offering opportunities for summer training of students, and sponsorship of many other student activities.

g) Resource Database for Engineers A resource website, an e-group, and a bulletin board can be formed up which can be used for sourcing out information and sharing ideas on all issues of structural engineering. Sudhir Badami, are you listening?

Some of these initiatives require funds but many of them require our time. It is for us to introspect as to what and how much we wish to give our profession for community based projects. After all, our own standing as professionals and our self-esteem depend on such projects. Are there some volunteers?

Have a nice day!!!

Alpa Sheth and Sudhir Jain

Gayatri Kharel [Fri Aug 30 08:45:01 2002]

Dear Participants,

It is very nice to go through the mails of everyone with different issues. I completely agree with what Ms. Seth has written. I come from a small place and not many people in that area are aware of the engineering practices and many people do not even know that there is a specialized field called Structural Engineering. There are many people who cannot afford to go an engineer to get the structural design for their houses to be constructed. At the most they can go to someone who can draw few structural details like foundation so that they can take that to the local authorities to get permission to build their house. After this most of the houses are built according to the design of masons. I have even seen same footing details copied and submitted for completely different structures to get permission for building. I do not know in what way the plans and structural details are checked before it is given permission for building. I think it is very important to work out something on how we can talk to local authorities on this issue.

There are some researches going on in different parts of the world on how indigenous materials can be used to make houses in seismically active areas. I am presently working on this issue and Dr. Jain has been helping me on this. I have been getting very good response from many researchers from around the world. In India we have many areas where locally available materials are used for building houses but they are not used properly and the consequence of that is dreadful. But the same thing used in a proper way can be very good and an example of that is Assam type house. I think it will be very helpful if we can prepare a report as well as guide on how locally available materials can be used in proper way to build houses. I will be very happy to volunteer to work on this issue.

Gayatri Kharel

Sanjeev Hanumant Mangoli [Fri Aug 30 08:45:04 2002]

Dear Fiends,

There is this news that recently the government has released the new IS. I believe that it is IS 1893. Now There is one building which has already been constructed as per the old code which was applicable few days back and the construction is over till the roof slab now because of this new code the authority is insisting that it need be implemented. Hence now they are strengthening all the columns from base ment. I will give the exact details of this building etc in my next mail. But can any one tell if this new code is really implemented and released?

Thanks

Sanjeev

J. S. Sondhi [Fri Aug 30 08:45:08 2002]

Dear All:

Structural Issues.

Yes In INDIA we do need a distinctive change from the Present System for Improvement of System

Presently in Malaysia- Due to Rules & regulations of Board of Professional Engineers- Only Engineers certified by this Board can authorise Construction drawings. this has helped the Engineers community here- No Foreign Consultant Engineer can effectively practise even the country encourages foreign participation. They have to hire a local approved Engineer to sign off the drawings. in the process the Local Engineering lot have been upgraded to International Stds in the last ten years, For Example: As an Indian Railway Design/ management company tried to enter Malaysia as Designers but could not get direct Consultancy, have to work in background due to the Professional Board of Engineers regulations. The business pattern thus developed helps the Local fraternity.

Hence- the System of Professional Licensing and its practise deligitly for approving drawings for Construction is the Right step. It initiates learning in Individuals for getting PE license.Plus an overall control over the Industry is maintained.

After all the Talking Lets put things in ACTION. Some one in Malaysia remarked- Indians are good in Technical- but don't take Final Action. India needs to build atleast 20 times of the Infrastructure Malaysia has made.

Best Wishes and Good Luck to the Endeavour

- JS Sondhi

Chirag A. Akruwala [Fri Aug 30 09:18:00 2002]

Hi everybody!

There is this discussion about having a professional organisation for Civil Engineers similar to other professional bodies like COA or IIA. I think such a licencing authority is necessary to reduce the number of malpractitioners and

quacks in the industry. Such an organization can help a layman differentiate between the qualified engineer and the self styled structural designer. This is all the more necessary in the present context when the level of engineering education has declined. I think the role of this organization should be to educate the common layman who wants to get a house built. The role of this institution should be to educate the society into correct building practices and points to look out for. Such a body can communicate with government and semi-government authorities to change their policy of awarding work to the lowest bidders. Resorting to legal action on unqualified people does not help improve the standards of construction. We live in a society where even draftsmen and masons practice architecture and civil engineering. Because of the expenses involved and the time taken in judicial procedures, it is not possible to take action against all illegal practitioners. In the seven years that I have been a member of Council of Architecture and the Indian Institute of Architects, I have seen 2-3 cases being resolved legally and in both cases the professional bodies had to bear heavy expenses for judicial proceedings. Only public awareness can help reduce this problem.

With regards,

Chirag A. Akruwala

Dr. S.K.Bhattacharyya [Fri Aug 30 09:38:02 2002]

Dear Friends

A wonderful deliberations through e-conferencing is on. Prof. Jain's suggestion of devoting some time to train and educate our younger engineers is well taken and arrangements can be made towards that.

However, we should not forget that finally the execution of civil engineering structures is accomplished through a group of workers, who are mostly illiterate and do not understand the implication of several aspects of civil engineering such as 'implication of water-cement ratio in concrete' etc. Unless, we can educate these people to make them understand, the effects of water on concrete, usage of good quality material, effectiveness of lap length of bars etc., it is difficult to improve situation, no matter how much pain we take to come up with accurate, economic structural design.

My suggestion is, along with the development of good structural design practice through conferences, discussions etc., we should enforce to have well trained (may be with trade license) working personnel (masons, labours etc.). Also regular training programmes of these personnel through video demonstration (to demonstrate the implication of good and bad practices), on-site demonstration

etc. are essential to improve the quality of construction.

The supervision of construction has to be very strict. No compromise should be made with the quality of construction materials. The supervisors should be courageous enough to 'Reject' material at site if they are not of acceptable quality.

Regards.

S.K.Bhattacharyya

Vikram Mehta [Fri Aug 30 09:44:01 2002]

Hi Alpa,

I completely endorse the view that the firm must be registered as 'Professional Engineers', rather than the individual designer. This will be a big step forward.

Regards,

Vikram Mehta

Rajiv Sharma [Fri Aug 30 09:46:01 2002]

Hello:

Mr. Gandhi's suggestion of asking help from senior engineers prompted me to think more deeply in the matter. Even after completing several years in design work an engineer may still need an opinion from others. Now the question is how he can get it? To whom he should approach if he doesn't know any Big Daddy of the profession?

I think the answer is to have a dedicated web site where anybody can post his query. It is believed that he will get some solutions or hints to solve his problem by discussing with other fellow engineers.

There are many sites on web where such discussions take place but I believe an Indian site with an emphasis on Indian Codes will be more helpful. I feel perhaps NICEE is the right place for starting such a discussion group. How do you feel about that I will certainly like to hear from you.

Regards

Truly

Rajiv Sharma

Mahesh Shah [Fri Aug 30 10:10:01 2002]

Dear All,

Many thanks for the organizers for the conference.

I agree with the concerns raised by Dr. Hari Kumar about the rural India. In this regards I would like to suggest that Geodesic dome structures (refinement of Lamella Domes) could be a cost-effective solution for rural population in earthquake prone areas in India. At C-DAC, we had carried out the earthquake analysis using SAP. The more information on this is available with me and I will be glad to interact with others on this.

Best regards,

Mahesh S. Shah

Narendra Pal Singh [Fri Aug 30 11:21:01 2002]

Hi everybody!

There is immediately need of having a professional organisation for Civil Engineers similar to other professional bodies like COA or IIA. I think such a licencing authority is necessary to reduce the number of malpractitioners and quacks in the industry. Such an organization can help a layman differentiate between the qualified engineer and the self styled structural designer. This is all the more necessary in the present context when the level of engineering education has declined. The role of this institution should be to educate the society into correct building practices and points to look out for. Such a body can communicate with government and semi-government authorities to change their policy of awarding work to the lowest bidders. Resorting to legal action on unqualified people does not help improve the standards of construction. We live in a society where even draftsmen and masons practice architecture and civil engineering. Because of the expenses involved and the time taken in judicial procedures, it is not possible to take action against all illegal practitioners.

Regards

Narendra

Suryanarayana Saripalli [Fri Aug 30 11:54:01 2002]

WE HAVE WORKERS / AND ENGINEERS-TRAINING CENTERS FOR MANAGEMENT WE DONOT HAVE AMERICAN/GERMAN SYSTEM OF VOCATIONAL TRAINING AFTER 10 TH PASS OR FAIL IN DRAWING/BUILDING CONSTRUCTION/ROAD CONSTRUCTION/PLUMBING/SURVEYING-WHICH WE ARE NOW TEACHING IN ETIOPIA. ALSO WE HAVE REASERCH CENTERS FOR WATER RESOURCES-DAMS-STRUCTURES,BUT NOT INSOILMECHANICS AANDFOUNDATION ENGINEERING

SURYA.S.N.

Narayanan S [Fri Aug 30 11:56:05 2002]

Dear Prof.Sudhir Jain and others,

It is indeed a stupendous effort to organise this econf.on good practices of structural engineering, construction methods, updating of knowledge,licensing issues of practicing engineers etc. The response from different sources has been overwhelming.Though some of the suggestions are repititive it may be possible to collate them and summarize and forward to the Engineering Council of India for possible implementation and follow up action.Definitely the proceedings of this conference would lead to a better awareness of the importance of safety considerations especially in aseismic design of structures amongst the structural engineering community.

S.Narayanan.

Vipul Mehta [Fri Aug 30 12:44:00 2002]

to everybody,

it was big manhunt for the structural engg. whose bldgs. were COLLAPSED & COMPLAINED but what about remaining bldgs. in india(may be in range 70%to 90%??? very rough estimation) which is NOT DESIGENED FOR QUAKE & WAITING FOR COLLAPSED IN NEXT QUAKE. what should be criteria to FRAME structural engg.?

vvm

Dhirendra Tripathi [Fri Aug 30 13:06:01 2002]

Dear Mr. Arvind Jaiswal,

Comment interspersed below.

Arvind wrote:

Your comment about "Cost Reduction" I would like to with CAUTION as this is one of the major culprits which was responsible for the Ahmedabad episode. Instead I would propose "Cost for achieving durable and functional Structure"

I too believe undue cost cutting is a major cause for structural deficiency. On the other hand the building industry continues to look for cheaper ways to do things.

Right now cost cutting is being done hap hazardly by builders and errant structural engineers with potentially disastrous results. The attempt to cut costs cannot be snuffed out. Under the circumstance if it must be done it should be done by those who are qualified to do it that is the structural engineers. In cases where no costs are left to cut a structural engineer can put his foot down.

I know the argument assumes a problem (industries penchant for cost cutting) not made by the Str. Eng.s , but they seem the best hope of curtailing the damage it causes. For this the structural engineers shall have to ensure they are aware of the totality of the project rather than only what directly concerns them.

For instance in Ahmedabad a building Sangemarmar collapsed in the quake of 2001. As the name suggests it was an opulent building all done up in marble. Unfortunately enough was not spent on having a seismically safe structure. Clearly cost cutting was done by uniformed persons with tragic consequences.

On the positive side if builders begin to have hope that the str. eng. will help to reduce costs safely then they shall respect their skills more.

You are right about being cautious, yet we do need to address the issue because there is no escaping it.

regards,

Dhirendra Tripathi

Dileep G. Bhagwat [Fri Aug 30 13:24:00 2002]

Hello All:

This is Dileep G. Bhagwat from AFCONS Infrastructure Ltd, Mumbai responding

on Chitra Javdekar's msg excerpted below -

"

** 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.

In my line (onshore marine structures and special foundations, which is quite different from the scenario under discussion) we, as design-construct contractors, submit a "DESIGN BASIS NOTE" to the clients/consultants/owners, which is supposed to be approved prior to the stating of the detailed design proper. This, treated appropriately, may create a lot of dispute at the outset, but avoids all the later problems. This could be included as a vital record in the general procedure for all works so that everybody knows (including self) what a structural engineer is committing to do in his/her design. It is a pity, however, that (as our experience shows) nobody who matters takes the necessary interest in the document when they should and raises a hue & cry only afterwards.

On other matters, I am a silent member of the audience of the conference.

D. G. Bhagwat

Sudhir Jain [Fri Aug 30 15:01:01 2002]

Dear Colleagues:

Suren Vakil has raised a very important point: that most consulting firms in India do not offer management share to its engineers. I have often observed that a bright young engineer after working for a few years with an established firm starts itching to open his own office. The result is that very bright young persons with sound technical and managerial skills leave the established firms. This results in leadership vacuum. I hear of many reputed structural firms of yesteryears which no longer exist because the owner left profession or died.

I have often wondered if structural firms could be run more professionally in india, wherein a competent employee-engineer after a few years starts feeling a sense of ownership for his firm, and hence, is bringing more business for the firm rather than going through the hassle of starting his own consulting office.

Any thoughts?

Sudhir Jain

D. G. Bhagwat [Fri Aug 30 15:01:05 2002]

We are all talking about formation of various types of organizations and passing of legal bills. This is valuable and needs to be done, but alas, is not entirely within our hands and means. But we can still start off an internet interest/discussion group of structural engineers. I have looked hard & could not find any in India. This forum should be free from all political/commercial/etc. interests & could be hosted by some public spirited structural engineer(s) at a low cost. (Again, no need to start a fund-raising activity)

It could cater for the following

1. specific structural design problems & comments/suggestions
2. sub-groups for e.g. buildings, bridges, port structures, foundations, retaining and sheet-pile walls, etc.
3. organizational discussions (as in this e-conf)
4. suggestions for codal revisions and comments on specific clauses and problems caused by them
5. voting on various issues and other points that occur.

If conducted efficiently, impartially and honestly, the forum would gain stature and grow up into a formidable association that will be able to put its power to

any worthy cause as, when and where required. I see all around on the web, important initiatives that have been established through similar processes. If nothing else, this would, at the least, give a place where we can continuously interact with each other. I, personally, have been longing for such a forum since years.

D.G. Bhagwat

Arvind [Fri Aug 30 15:35:01 2002]

Dear Vipul Mehta,

Majority of structures which did not collapse can be categorised into following groups:

1. Government Buildings: These did comply in most of the cases with the codal provisions, hence not to worry.
2. Private buildings which complies with codal provisions- also need not worry.
3. Private buildings which did not comply with codal provisions:
 - a. without soft story- Hence should be checked for structural soundness.
 - b. with soft story- should also be checked for structural soundness.

One CAUTION should be born in mind that just because the structure has not got damaged, does not certify that it is EQ Resistant. Methodical checking has to be done.

With warm regards.....Arvind

Arvind [Fri Aug 30 15:35:05 2002]

Dear Dr. S.K.Bhattacharyya

National Academy of Construction at Hyderabad does have one such institute called "Workers' Training Institute" which caters for the exact requirements listed and desired by you.

Now what is required, the same model can be duplicated in other states. Political will and mandate only can make the things happen.

With warm regards.....Arvind

Ashok Yog [Fri Aug 30 15:42:00 2002]

Dear distinguished participants of the Conference,

Had been going through the proceedings of the e-conf. Lots of useful suggestions and plenty of repetition-some pertinent and lots are about the sharing of the individual's miserable experiences with other fellow participants.

Let's draw an action plan. However, before the action plan we have to have clear objectives- or if it is difficult to do so, let's have an expert volunteer or even paid expert of universal repute as it is an specialist's job and cannot be anybody's whims and fancies.

However a few things are clear:

1. We need to do some thing to improve the lot of Civil Engg professionals.
2. The problem has several aspects and needs to be addressed globally- technical excellence, social recognition, legal framework conducive to achieving the desired objectives related to the Civil Engg. profession etc... etc..
3. There is a dire need to define an Engineer- ie a professional engineer. A person who acquires a degree-may be a graduate or a master's or even a Ph.D., cannot be termed an engineer for the rest of his life, if he does not keep him/herself abreast with the developments in the field. After spending 42 years with the profession, I can state that 99% of beaurocrat- so- called-engineering govt. officers are not engineers in the real sense and it is these ,who are responsible for the evils of the profession, which is almost dead outside the premises of Tech. Institutions. And ,I may be pardoned for being impertinently truthful that the profession is decaying in these institutions also because of the the absence of the fresh air which is available only in the field and real life applications. I know and you know that what is the truth in the above statement.
4. So, a cadre , some thing like that of chartered engineer's in 'real sense' to be instituted with ruthless selection of members from within ourselves. If we are not ready to succumb to this self purging, not much can be achieved. Let it be a small group but with the un paralleled diginity and reputation through engineering feats, which nobody should be able to or can question.
5. If the above process can be accepted by us unanimously [democratically], we can have some hope for the future. B'cause only then we would start tackling and

correcting the situation on various fronts including legal, and disciplinary matters. These may also include Public Interest Litigations. After all Civil Engg. can not turn his face away from some thing going grossly wrong involving his profession say buildings and structures in earthquake prone zones or not keeping the relevant engineering data from such a site which is a rare painful opportunity for any Civil Engineer . This is necessary to have purposeful collective effort for achieving the desired objective.

We must make this body so strong by our collective effort that it can haul up the highest beurocrat or even a public figure-say minister in the interest of the profession and thus in the interest of the nation. After all Engineering is nothing but logic applied to the benefit of the humanity. Civil Engg has to take the lead in this regard as it is their basis of existence.

6. And in doing so, I am afraid that democratic processes, in the conventional sense, would not be of much avail. A select group of practicing engineers who have personally contributed to the profession's excellence or reputation, should be inducted at the first stage. They have to be above political and other forces. And the whole community should support them for everybody's [ie whole engg. community] benefit. Indirect benefit would accrue to even those having an engineering degree but not on the list of chartered/registered members of practicing Civil Engineering profession.

Once again I may request for being pardoned for being critical. Humbly and,
Sincerely
Ashok Kumar Yog
Retd. Addl. Director General,
RDSO, Minis. of Railways, Lucknow.

Shirish Patel [Fri Aug 30 15:58:00 2002]

Dear All,

A whole range of interesting issues has come up in these discussions. Let me add my two bits:

1. On civil engineering, architecture, structural engineering, designer, contractor: We tend to forget that two hundred years ago these were all one single profession. The master builder conceived a design, worried about its aesthetics as well its structural stability, and organised its construction. We only have to look all around us, anywhere in the country, to see what wonders they achieved. Craftsmen were recognised and honoured (they must have been, otherwise how did they deliver such spectacular work?). The world has grown more complex

since then. With so much new technology in place, construction is now too intricate to be masterminded by a single individual. But we should not forget that each of us, with his particular expertise or specialisation, is a member of a larger group that should work towards a common objective: excellence in construction. We want excellence in conception, in design, in detailing and in execution. To achieve this, it is particularly important that the leaders of the team (the group that replaces the master builder) are individually skilled not only in a particular expertise, but also have enough of a generalist's background to understand and appreciate the work of all the other members. I am appalled for example that the three most recent recruits to our office (all engineering graduates, one of them with a Master's degree) do not know that in a bathroom there are two separate waste pipes, one for sewage, one for sullage. Nor could they, when they started, draw the simplest sketch: a plan of the room they sleep in, more or less in proportion, with furniture shown. What is the use of their expertise if their general knowledge of the building profession, and their basic skills, are so dismal? Architects are encouraged to conceptualise with no understanding of structural stability. Engineers are taught to compute without developing any skills in conceptualisation. Unless each understands at least something of the concerns and preoccupations of the other, and unless each has at least some of the basic skills of the others, we will not build the strong teams that excellence in construction requires.

2. Where do you see the best work happening: This topic has not come up in the discussions, but I am adding it as relevant. The best work seems to occur when architectural skills and engineering skills are closely integrated. Ove Arup is an engineering firm with a strong architectural presence within it. In India some of the most exciting structural engineering work is being done by Dhananjay Dake, a structural engineer in Pune, running a firm where his brother is an architect and his father is a contractor. Santiago Calatrava is a qualified architect who has also qualified as an engineer and is producing some of the most remarkable work around the world. The message is clear: to do good work, you must re-integrate all those skills that modern technology has blown apart.

3. On who should be the project leaders: We work with architects, and in some cases they take the lead role, in others we take the lead role. Sometimes on the same project we reverse roles, depending on whether the architectural content or the engineering content is more significant for a particular building. Very often on such projects we share the fees half and half. On bridges we usually have a consulting architect who plays a relatively minor role, but he is there. So the leader should be whoever is best equipped to lead for that particular project, and this will depend on the content of that project. There is one trend however that we should note. Architects, in the course of their education, are naturally led to think about broader issues than the specific project they are working on. As a

result, they engage more readily in civic issues. Civil engineers less so, and Structural Engineers practically not at all. In that case, is it surprising that leadership roles are more readily assigned by society to architects?

4. On depending on architects for fees: We have long since stopped working for architects who do not promptly remit to us our share of the fees they collect from clients. Most often we ask for, and obtain usually without difficulty, a direct appointment by the client, independently of the architect's appointment. Our fees come from the client directly. This has the merit that we get our fees when the structure is complete, and do not have to wait interminably for our share of fees when our work was long since finished.

5. On the gap between education and professionals: This is sad and needs urgent rectification. In medicine they have teaching hospitals, where teaching and practical experience happen together. There are long periods of internship where practical experience is added to taught knowledge. In the legal profession young lawyers work as juniors in larger teams for many years before they have the responsibilities of individual practice. In our profession we seem to feel that education alone is enough to make someone a responsible practitioner--as if a Master's degree alone, with no practical experience, were sufficient. Wherever did we get this idea? We have Master's degree recruits in our office who are not only incapable of drawing a simple sketch; they are incapable of visualising simple details. I think there needs to be much more intensive interaction between our Engineering colleges and our professional practitioners--after all, the purpose of the education is to produce, at the end of it all, competent working professionals. Which also requires continuing education, beyond the original degree courses.

6. On tendering for design services: This has created havoc, as someone said. Even the 80/20 system so commonly used, with 80% marks for technical evaluation and 20% for fees quoted, does not work as intended. The reason is that the technical evaluation is sub-divided into a number of different heads, and at the end of the process all the firms that pass the minimum mark are ranged within a fairly narrow band. The fee difference then determines who gets the job, and even with a short list of invited tenderers, there will always be someone who quotes ridiculously low to grab the work. How can anyone in his right mind believe that the best service is also the cheapest? And it is obvious that the cost of the service is a tiny fraction of the cost difference between a good and an indifferent design. In the UK, where procurement of design services on the basis of competitive bidding over the last 15 years has shown poor results, they are thinking of going back to a scale-based procurement. The right approach was formerly used in the World Bank until Indian Audit, that insidious, devastating and destructive force, persuaded them to change their ways. This was to rank the

submissions in order of technical merit, and then open the financial bid of only the highest ranked. This was followed by negotiation of the fee, and if this was satisfactorily completed, the remaining financial bids were returned unopened. If the negotiations with the highest ranked consultant were not successful, his financial bid was set aside, and negotiations began with the second ranked bidder. But you could not return to the first ranked, even if the second ranked was costlier. The first offer was closed and could not be reopened. The essence was to award work on merit, not on the basis of who quoted the lowest fee. Once fees are reasonable you will find Consultants will be able to pay decent salaries, better young people are attracted to the profession, time can be spent in keeping oneself up to date--all the more essential since work is awarded on merit--and time can be devoted to interacting with academia and to work on Codes and Committees. The status of the profession inevitably rises.

7. On Values: In our office we follow a simple set of rules when we have to make difficult decisions. The project comes first, you do what is best for the project. Protecting and guarding the client's interests comes next, and by client on public works we mean the public, the final users of the project, not necessarily the officer we are currently dealing with. Then, the profession. And finally, ourselves, and the prosperity of our own profit-sharing enterprise. Unfortunately what we now see, increasingly, is so-called professionals (because they have a degree) concerned primarily with themselves, with no consideration for the profession, for the long-term welfare of the client, or for the fate of the project. So we need to think through what we should do to turn this around, and how to go about it, step by step.

Looking forward to more on these and other topics, & with regards,

Shirish Patel

Datta Kare [Fri Aug 30 16:07:01 2002]

Dear Mr. Jaiswal and the moderators and all colleagues,

About the fees,

Undercutting is a problem in all professions and business. Perhaps market forces, competition dictate (I agree with Mr. P. K. Singh, Director, ECI) but the clients have to strike a balance between quality and value paid for the services.

How does a government or semigovernment body select a consultant? Whom (firm) they will appoint?

Based on Engineers bill recommendations, say 'x' percentage is decided to be

paid (if engineers bill is enacted and at all speaks of fees & salaries, till then let us base of COA guidelines)

A) With regards to a particular project, They prepare prequalifications with regards to volume of work executed, educational qualifications, etc. Still there will be quite a few with these prequalifications, How to select one?

B) Another method followed, Empanelment of consultants for various projects say bridges, adm blds etc Still there will be quite a few empanelled with given prequalifications, (I believe ranking amongst empanelled consultants is very difficult, once they are empanelled they are at par) How to select one?

The recent confirmed trends in neighbourhood during selection of consultants in these bodies:-

1) The government Engineers themselves in partnership or in dummy names gets prequalified or empanelled and get their firm appointed at the beginning (any way one firm has to be selected). The empanelment or prequalifications are dissolved by the time the genuine consultants' turn comes up!

2) Kickbacks. The firm who is dynamic enough (Definitely not technically) notches up the project (any way one firm has to be selected). The empanelment or prequalifications are dissolved by the time the genuine consultants' turn comes up!

3) The conditions are set to fit a particular firm.

Please suggest a methods for genuine selection.

If government prequalifies or empanels, say 5, based on conditions set, I think they are at par. I think bidding is the only option left amongst the prequalified or empaneled ones to avoid all the shady deals. Well, the clients have to specify the quality of work expected from the consultants (Turn key process projects specifies minimum the number of drawings to be issued, min details expected, min number of site visits etc.)

Datta Kare

Viral Jasubhai [Fri Aug 30 16:08:01 2002]

Dear All,

The deluge of email in this econf has been very heartening & enlightening.

I fully agree to the email of Alpa. We were one of the only firm in Ahmedabad who had offered free services to all the frightened persons staying the buildings in this city as well as in Gandhidham. A lot of the details of the buildings such as Mansi & Shikhar were available to us & our findings were shocking.

We need the Engineer Bill to be ratified & I have seen a lot of the mail which makes me happy that we can expect positive action soon.

Regards,

Viral Jasubhai

Hemant Vadalkar [Fri Aug 30 16:18:00 2002]

Dear professionals / consulting structural engineers ,

We have to find out the solutions to the problems faced by us and work together to improve the situation.

1. Training to all civil engineers after graduation and continuous training to professionals -

Medical professionals, Chartered Accountants can not practice on their own unless they complete some kind of training for 2-3 years. This is true for engineering consultants also.

For working professionals, updating knowledge on the latest materials and latest software available is required.

2. One single body (All India Level) should control the license and the membership issue :

By conducting examinations and interviews, license can be granted in different categories for individuals and firms based on experience and resources available. This license should be valid all over India. There can be Class A, B, C registration for firms. Fee structure for different classes can be decided by the apex body. To some extent, this can avoid unhealthy competition and cutting down fees to grab the job.

3. Standardization of stability certificate, design parameter sheets & proof checking

ISSE has published the guidelines and formats to be used by the structural engineers in this regard. Design parameters must be given in the structural drawing which will be useful in future. Some standard format for providing data for proof checking will be helpful. Local bodies can appoint expert panel for randomly proof checking the design of consultants. This will discourage cutting corners in the design, detailing and code violation.

I hope something good can come out of this E-conference.

Hemant Vadalkar

Mahendra Raj [Fri Aug 30 16:29:01 2002]

Sub : About Engineers' Bill

In the emerging world scenario dignified existence of a developing country will depend on the speed with which it catches on with developed countries. This speed will depend on the strength and competence of the country's Scientific and Technological Base.

In India we have created a strong and competent Scientific Base. But, somehow we have not been able to create a strong and competent Technological Base. Whether it is creation of infrastructural facilities of setting up of heavy industries or production of quality consumer goods, we still depend heavily on technological input from the developed nations. A strong Technological Base is formed by highly qualified, well trained and experienced competent engineers.

We have set up academic as well as R & D institutions for producing highly qualified engineers but we have not created a corresponding mechanism to monitor, guide and regulate the training and experience of an engineer before he reaches the decision making level in his professional career. This one shortcoming is costing the nation heavily as it is impeding our rate of development, and is coming in the way of our acquiring independence from foreign technologies and technologists.

In this background, the then Association of Consulting Engineers (India) (Now Consulting Engineers Association of India) drafted on Engineers Bill as in early as 1990 and submitted the same personally to the then HRD Minister, Mr. Raj Mangal Pandey. This was followed up by a series of meetings with senior official (of HRD Ministry and Law Ministry; the then Engineer - MPs (incl. Maj Gen B C Khanduri & Mr. Krishna Kumar); Successive President of Institution of Engineers (India); AICTE; Mr. APJ Abdul Kalam (now Hon. President of India).

This draft Engineers' Bill, proposes to set up a self-financing, self-regulatory system to assess the quality of training and competence of a graduate/post-graduate engineer and accord him a status higher than the engineering degree thereby allowing him to practice the profession of Engineering in India.

Salient Features of the Draft Bill

- * An independent Board of Professional Engineers of proven standing from different disciplines will be set up.
- * The Board will be empowered to guide and assess training and experience of an engineer.
- * After graduation/post graduation, an engineer will be registered as "Engineer-in-Training" and will acquire training in any accredited organization.
- * After completing the training period an Engineer-in-Training will have to clear a test in his discipline and in his field of specialization to acquire the status of Professional Engineer.
- * During his professional career, a "Professional Engineer" will have to update his knowledge through a monitored process of Continuing Education.
- * In Private Sector only a "Professional Engineer" will be licensed to practice the profession of Engineering.
- * In Public Sector an engineer before reaching a specified senior position will have to acquire the status of a "Professional Engineer".
- * In the event of indulgence in unethical, unprofessional, or irresponsible behaviour, the status of Professional Engineer will be revoked and he will not be allowed to pursue the profession of Engineering in a responsible position.

Need for the Engineer's Bill

- * To create an environment in the country in which engineers aspire to achieve a higher level of competence than they possess now.
- * To create a strong Technological Base in the country, fully equipped to meet the demands of the next century.
- * To ensure that engineers pursuing the profession of Engineering in India acquire such a high level of competence that they can pursue their profession in

any part of the world.

- * To safeguard the Society from unethical and incompetent engineers.

Objectives to be fulfilled by

- * Monitoring and assessing the training and experience of a graduate/post graduate engineers.
- * After successful completion of this training and experience, according him a status higher than the degree which only qualifies him to reach a decision making level.
- * Withdrawing this higher status in the event of unethical, unprofessional and incompetent behaviour.

The Engineering Council of India, formed recently, has taken over the responsibility of preparing a final draft of the Engineer Bill for consideration of the Government.

Dr V V Nori [Fri Aug 30 16:56:02 2002]

Dear Colleagues,

My reponse will reach you at the best as the conference comes to an end. For some reason (non structural !!) I have been receiving views of participants but am not able to send e mails. Perhaps the Almighty wants me to read what other's say and not make colleagues read what I have to say. I do agree with some of the reponses regarding sharing information and publishing articles. In SPA we hane always believe in sharing information. When invited we do deliver lectures which are mutulally beneficial. I do not agree that to practice as a consulting

engineer you have to have a post graduate qualification. I would like to say that it is more important to have the ability to make clear sketches and appreciate construction problems. We are all civil engineers; When we call ourselves as Sructural Engineers we should not forget that we are civil engineers and should possess grip on all aspects of civil engineering which has been taught to us at graduate level.

But my fundamental question is "Do we love and respect our profession ?"

V V Nori.

Dear Colleagues,

We civil engineers find ourselves in an appalling situation for which the blame lies squarely with us. I would like to list the following points:

Over the years we have lost the love for our profession. The very profession which has enabled us to earn a livelihood.

There is no creativity left in our profession.

We do not put into practice even the "very little" that we have learnt in the engineering schools. For instance there are many buildings in Mumbai designed by qualified engineers (even foreign returned) only for vertical loads.

We have become subservient to the Architects and Builders. And now subservient to computers and software. To start a consulting practice it is enough if you know codes and are familiar with computer software. In the course of reviewing I have come across very serious mistakes which might never have occurred if a simple manual check was performed.

Only a few of us are members of professional bodies and out of these few most do not follow the guidelines of the very bodies for which they are signatories.

We work in water-tight compartments (Design Engineers, Site Engineers, Geotechnical Engineers, Contractors, Geotechnical Engineers, Architects etc). We are not interested in the overall quality.

Even before globalisation clients have a tendency to prefer foreign consultants. I have on more than one occasion come across very poor engineering solutions and reports emanating from foreign consultants/specialists. This does not suggest that we have nothing to learn from foreign consultants. We should look at the manner in which Chinese Civil engineers have forged way ahead of us. It is a matter of dedication, self-belief and national pride.

Even the best of us seem to be satisfied when code provisions have been complied with. We see very little innovation emanating from Indian Consultants.

What then is the solution?

It is very difficult to change old habits. But we have to change if we want to arrest the downward slide. We should stop underselling ourselves.

We must not compromise on basic engineering principles that we have learnt. We need to update our knowledge base. We should take interest in the over all quality of the construction. We must give back something to the profession which has given us our livelihoods.

Our work should be creative. How many of us know about the life of Prof Terzaghi, or Freyssinet

We should seriously introspect individually first and perhaps collectively later.

Finally I would like to apologise if my comments appear arrogant to the recipients of this mail. I am only trying to share some thoughts. I have held myself guilty for not having done enough for our profession which I consider to be a very noble one.

V V Nori

D. G. Bhagwat [Fri Aug 30 16:58:01 2002]

I have been working as a structural designer/engineer in AFCONS for the last 22 yrs in various capacities and am willing to volunteer for mentorship to be provided to young engineers on the following analysis/design topics (details could be discussed when an occasion arises) - Bored cast-in-situ piles
Precast+insitu superstructure Sheet pile walls, diaphragm walls Onshore marine structures (jetties, quays, relieving platforms) Special foundations Temporary steel structures

D. G. Bhagwat

Sivakumar K [Fri Aug 30 16:59:01 2002]

Dear Professor Sudhir K Jain, Ms. Alpa Sheth and all my eminent colleagues,

Good evening to all of you.

While we focus our efforts on getting the due recognition for our profession, it is also imperative to update our knowledge of the technical advancements as frequently as possible. At the time of renewal of professional license after a certain period, it should be made mandatory that, the engineer should have undergone certain number of short term training courses. The courses can be conducted by reputed academic institutions and the same can be coordinated by the Engineering Council of India. The quality of the structural professionals can be assured to be the best thoroughly.

Regards.

K. Sivakumar

Kiran Akella [Fri Aug 30 17:17:01 2002]

Dear conference participants,

“Please Stop Young Engineer Bashing”

A lot of things are being said about the skills of new engineers coming into the profession and the need for practical training. Though practical training is necessary to some extent, what is more essential is a strong foundation of theory. By bringing too much emphasis on practical training in engineering education, the engineers coming out would be very specialised like welders or crane operators and not those who could solve a variety of problems and play the wider role that they are supposed to play. It should not annoy the experienced structural engineers if the new entrants do not know details that there are two outlet pipes in the bathroom. What they should look for is the capability of understanding the system. It is not for specific knowledge that the engineering education stands for, but to build the abilities to define and solve a problem when one is encountered. A person with a reasonable aptitude can gain the required specific knowledge anytime.

Engineers who have gained a few skills over 10-20 years of working in the profession, should not use them to bully and discourage the youngsters, but provide an environment that will allow lateral thinking, which comes so easily to a fresh entrant. It's a pity that most of the senior engineers are worried about the young engineers not knowing specific provisions of the code or knowing the cross-section area for a particular reinforcement diameter or ultimate stress of pre-stressing steel, and not bothered about instilling proper ethical values and leading by example.

Any opinions?

with warm regards,

Kiran Akella

M. Hariharan [Fri Aug 30 17:31:01 2002]

Regarding licensing issues...

The states in the US appear to have regulations in this regard. There are minor differences between the rules of different states. A study of their rules may give a good idea of how to get an Indian regulation, which has minimum problems.

M. Hariharan

M. Hariharan [Fri Aug 30 17:43:01 2002]

It has been a pleasure going through the various correspondences. May I add my input to some of the points mentioned? The post has become quite long!

1. There seems to be too much of discussion regarding building design and construction, role of Engineer vs Architect etc. As one who is not directly engaged in the conventional civil engineering projects, I would like to know the reason for this. I could think of the following reasons:

- There are more engineers involved in building industry - The engineers in building industry have more concerns (or problems) related to professional issues. People in other industries (Transportation, power, irrigation etc, Chemical, oil&gas, marine etc., which also employ a number of Civil / Structural engineers) do not seem to be so vocal. Are they satisfied with their professional career? Incidentally, I might be categorised under this category, and I don't have much grudges.

2. Third Party Verification / Proof Consultant

It is a mandatory requirement in Offshore industry to have a third party verification and certification (not only of the structure but the entire facility) as a pre-requisite for insurance cover. Some organisations in India have also gone for a similar check, and I think it is a good and required practice.

There is a website: www.seaint.org (Structural Engineers Association International) which contains a discussion forum similar to this one. Similar topics are discussed there. All past discussions are archived.

There seems to be a standard verification and acceptance requirement and practice in all city / county jurisdictions in USA for structures / buildings. Similar requirement may exist all over the world. In India, I understand only architectural plans are submitted for approval, no structural design verification is performed. This needs to be changed.

It is not practical for the government / local authority to perform the verification of design for all buildings. The easiest way of implementing the requirements is to ask the owner to get a third party verification performed at his cost and to submit the certificate of compliance to the approving agency. All structural / architectural firms competent / registered within the city to perform the original building design shall also qualify to perform the third party review. Since the two organisations (designer and reviewer) are competitors, generally errors will not be allowed to seep through, unless both are incompetent. I have been functioning in an environment of third party verification for the past 25 years, and the experience has been quite satisfactory and positive. After it is accepted that such a review by a competitor is a part of the profession, there will be no major hassles. This exercise may be waived for buildings, whose size / dimensions / purpose are not considered critical.

There could, of course, be instances like the experiences of Pankaj Gupta, Chandrasekharan etc., but overall, it is better than no checking.

3. Architect vs Structural Designer

After the earthquake in Seattle a couple of years ago, the local TV station showed the photographs of a few architects whose buildings survived the earthquake, and gave credit to their "design" for the survival of the buildings! The entire structural engineering community was shocked and the e-mails in SEAINT forum described their anger, the ignorance of public and the media etc.

The common man's understanding is that the architect designs buildings, the engineer designs bridges, dams etc., (where the architect is not involved).

Mr. B. S. Mahmood wrote about Govt. ads:

" recently/normally we read about advertisements in the papers inviting Quotations for the Proposed project and in the terms and conditions there will be a point that the applicant should be an Architect registered under the council of Architects."

This point should certainly be taken up. The applicant, (particularly for a high-rise building) could as well be a structural engineer, who can subcontract architectural planning to an architectural firm. One may get more competitive bids! Such combinations are permitted in other industries. Mr. Arvind Jaiswal has suggested the proper wording:

"Yes, I agree with you on this point. That is why first step is not to use title as Architect, try using 'Project Consultant' or Consultant as title. Second step is to

educate the Govt departments that in a bid to call for quotations they should mention `Architects / Consulting Engineers / Project Consultants of repute and request them to delete the words `Registered with COA' ".

4. Fly ash

Mr. Shreekanta Rao has raised a very valid issue regarding use of fly ash for construction. There is a National Fly Ash Mission set up by Govt. to propagate the use of fly ash. They would provide requisite technical data and help.

5. Rural construction

Mr. Harikumar's concern regarding rural housing / construction is very valid. I don't think adequate attention has been paid to this topic. I have seen buildings on Himalayan slopes - Framed structures with walls made of cement bricks. Inappropriate technology? Or, am I unaware of some recent developments, which make the use of such bricks appropriate for the region? What about use of local technology and materials for rural housing? people must have evolved some local technologies which are appropriate and cost effective. Has any study been performed to assimilate that knowledge and to refine it, if need be? Such studies can be easily performed by the local engineering institutes with minimum funds, and Ph. D's are not required, nor major analytical setup. Is there any such study under way in any institute?

Dr. M. Hariharan

Amod Mani Dixit [Fri Aug 30 17:52:00 2002]

Thank you, Dear Sudhir, for your mail.

I was following the conference off and on (several mails still to be read) because of the irregularity of my health. But most of the time I was appreciating the wonderful effort that you and your colleagues have put on organizing this econf. What an idea! The last one you organized in 2001, and this particular econf has given me so much of self-confidence to be working and thinking the the field of earthquake risk reduction in Nepal. It is so nice to see that there is a whole army of educated engineers in the subcontinent, who not only carry with them the sophistication and wisdom expected of the people of the region, but are sincerely trying to take the difficult path of trying to implement solutions step by step and starting from small and do-able ones.

I am not a structural engineer, not even a civil engineer, and I don't have the rich experience in the field of construction like many of you have. So my experience

of working mainly in non-engineered informal construction may not be of value. However, I felt that 1) there is a lack of dialogue between a professional (civil engineer, structural engineer) and the user (community, client); or between the professional and the decision/policy maker: either side does not understand what the other side wants or what the other side can give, 2) there is a lack of understanding on the "possible harmful" effect of this lack of dialogue or understanding, and 3) either there are no institutions/mechanisms/strategies or the existing mechanisms do not have enough motivation to facilitate this dialogue, and pre-empt the bad effect of this lack of understanding. In such environment breed all the problems that the econf is trying to address.

These problems are known since years. The solutions have largely been identified. The econf is further trying identify many new solutions and putting up new recommendations. But they will work only if put into practice. Implementation is always difficult - be it professional exams, peer review process, establishment of central governing organization, society of structural engineers, better continual education, betterment of legal and policy environment, and so on. We know that it will not be possible to solve the problem at one go. We have to work step by step, doing the do-able, convincing the convinceable, improving those aspects which are most likely to improve. But act we must now. And act many times even outside the field of structural engineering. Each act will take us closer to the desired goal.

When Anton Chekhov was saying that a human being must have everything beautiful, he perhaps was emphasizing the need of comprehensiveness and totality in our thinking. The problem of earthquake engineering is not any inherent controversy between architects and structural engineers (look at the marvelous blend of the two professions in all the cultural heritage site in the subcontinent!), but due to the lack of working dialogue between not only the two professions but also with those who hire the two professionals to get the construction designed and constructed, and those who use the creations/work of all the three or more professionals. Thus the problem covers more than the fields of structural engineering or architecture - it goes into the areas of our (the whole society's) behavior, our thinking, our attitude.

What you have suggested, Prof. Jain, is exactly what should be started! And there could be so many more things to do, which at times depend upon local situation also.

For example, last year NSET requested engineering colleges to involve their students in our program of building inventory of Kathmandu. 100 students participated during their vacation. About 1100 buildings were inventoried within about two weeks time. Thanks to this work, now we have some semi-

detail knowledge about the building stock of Kathmandu (typology, materials, strengths, weaknesses, vulnerability), and we can talk about vulnerability more confidently than before when such knowledge did not exist. The students are happy that they did something that not only fulfills part of academic requirement, but also gave them knowledge that is not included in the curriculum. The engineering colleges are happy that a very successful program of fieldwork has been implemented. Everybody wants to continue this practice.

I look forward to learning more from this "e-shastrartha" in structural/earthquake engineering. Thank you.

Amod Mani Dixit

Mahendra Raj [Fri Aug 30 17:52:04 2002]

A lot of views have been expressed about the inter-relationship of Architects and Engineers in a project. There are many misunderstandings and misconceptions about their interaction. These can be better understood by examining the present practice and its impact on the profession.

THE PREVALENT PRACTICE

The prevalent practice in the private sector is that the client selects an architect and entrusts the entire project to him. If the client is knowledgeable about the importance of contribution of other disciplines to the project he participates in the selection of other consultants. If he is not, this selection is left to the discretion of the appointed architect. In either case the client enters into an agreement with only the architect and makes payment of the professional fees to him. The architect in turn has agreements with all other consultants and makes payment to them.

In the prevalent system the client trusts the architect implicitly and completely. He transfers his own functions, his concerns, his headaches, his responsibilities on to the architect. This in practice makes the architect the de-facto client for the professionals of engineering disciplines. This system supposedly avoids multiplicity of responsibility and saves the client the trouble of dealing directly with a number of professionals.

Multiplicity of responsibility must be avoided. There are no two opinions on its. The project must have a professional leader cum coordinator.

However, the prevalent system is based on the misconception that the function of coordination is synonymous with the functions of designing and design

synthesis.

DESIGN is the activity of professionals - engineering and architectural - who together contribute to the evolution of a concept which is optimum for most of the disciplines so that ultimately the project can be aesthetic, functional and cost effective.

DESIGN SYNTHESIS is the activity of optimum integration of requirements of all disciplines in the project.

CO-ORDINATION is the activity of ensuring and monitoring that requisite input of various disciplines is received the project at different stages of work in appropriate time.

Designing is an activity performed by an architect as well as all other professionals of the engineering disciplines.

Design synthesis is an essential part of an architect's contribution to a project, yet it is to be performed in consultation with and in complete agreement of, professionals of engineering disciplines. That is, the synthesis is the subject of decision of all members of the design team.

Coordination is a distinct and separate activity which can be performed by any one member of the team of professionals who has the requisite experience and maturity. By training and aptitude an engineer is more qualified for the activity of co-ordination. As such, to avoid multiplicity of responsibility, it is best for the client to hire and deal with all professionals separately and yet make one of them the coordinator or the leader who is responsible to him to get requisite and timely inputs from all professionals.

The lack of understanding of the three activities and entrusting responsibility of proper performance of all the activities on the architect has led to exploitation of the client as well as of professionals of engineering disciplines.

PROBLEMS OF MAKING ARCHITECT THE DE-FACTO CLIENT

1. the client relinquishes his right to ensure that the project gets the most competent professional input. He remains under the mistaken notion that once he has selected an architect, it is the architect's headache and responsibility to organize and provide best possible professional inputs. But more often than not, this does not happen and, at times, the client is not even aware of it.

2. The client does not know that 60 to 70% cost of the project is controlled by

engineering disciplines, and he that for the project to be functional and cost effective it is essential that professionals (who control this large component of the expenditure) are selected as carefully as the architect.

3. The tendency of the architect is to evolve a concept in isolation and get it approved without involvement of other professionals.
4. Even when the architect hires the most competent professionals and even if their involvement commences right from the conceptual stage, the client may not receive the correct version of the advice and comments of all professionals.
5. Often the architect, in order to minimize his own input, tries to push and sell a concept which does not necessarily have approval of other professionals.
6. Even when a knowledgeable client participates in selection of most competent consultants, ensures their participation from the conceptual stage, interacts with them directly, but if they are hired by the architect the chances are that he does not get free, frank and unfettered advice from the professionals.
7. If the architect fails to organize and provide the most competent input of other professionals at appropriate stages of work in the project, it amounts to betrayal of the client's confidence in the architect and exploitation of the client's ignorance by him.
8. The architect has a tendency to exploit all other professionals of engineering disciplines in terms of their remuneration and recognition of their contribution.
9. Since the architect decides on the remuneration of other engineering disciplines, he overvalues his own contribution and undervalues the time and contribution of other disciplines.

FEE DISTRIBUTION

The present fee distribution is not compatible with the responsibilities carried by professionals of different disciplines.

Magnitude of work to be put in by different professionals at different stages of a project varies. The mode of payment of fees is not in conformity with the proportion of work done by different disciplines at different stages of work during planning as well as construction. As a result some of the disciplines get compensated for their efforts after considerable delay.

For example before foundations are done the entire structural concept has to be

frozen after detailed investigation and analysis, but payment at that stage is not commensurate with the work done by the structural discipline. Similarly the entire structure gets completed much before final completion of the building with all the finishes and services. Yet payments of even structural disciplines are linked to final completion of the building.

Payments related to suspension, postponement, or delays in completion of a project and held back, affect even those disciplines which might have successfully completed their entire work by that time.

Full and timely recovery of the fees by different consultants from an architect is an exception rather than a rule.

The architect, by under payment of the dues of various professional engineering disciplines inadvertently creates an interest free loan for himself which he repays as and when it is suitable to him. This benefit he derives simply by being the paying agent of the client for the services provided by other professionals.

Dissatisfaction of the client with performances of an architect at times leads to withholding his payment. As a result all professionals some of whom might have completed their entire work do not get paid.

If payment of a professional is delayed or denied on the plea that the architect himself has not received the payment there is no way the consultant can verify this statement.

The system permits some of the architects to keep some professionals under a perpetual bondage. A professional works on a project, completes it, does not get paid and in the hope of recovering his payment works on the next project and so on and eventually finds himself in the position of a "Bonded Slave".

At that stage if he protests too much, the architect calmly drops him on one pretext or another and finds another one to exploit similarly. The dropped professional has no way of recovering his accumulated outstandings and has to forget about them.

RECOGNITION OF SERVICES

In the prevalent system credit for projects is taken essentially by the appointed architect. As such professionals of engineering disciplines do not get known in the community of clients and it inhibits the growth of their professional practice.

DIRECT APPOINTMENT OF PROFESSIONALS OF ENGINEERING

DISCIPLINES

With direct appointment and direct payment of all professionals, one of whom is designated as a leader-cum-coordinator it is ensured that :

- the most competent and suitable professionals for the project get selected.
- the project receives proficient input from all professionals at appropriate stages.
- the client has direct access to unbiased opinion of all professionals.
- all professionals receive equitable compensation.
- payment received by each professional is commensurate with the completion of his work.
- burden of errors and omissions of one professional has not to be carried by other professionals.
- the profession of building engineering attracts good engineers.
- all professionals get due recognition in the community of clients.

Prof Mahesh Tandon [Fri Aug 30 17:52:08 2002]

Dear Dr Jain,

Thank you for your invitation to participate in this econf. of vital interest to the practicing professionals in the field of Civil Engg.

I wish to share the following ideas with co-participants:

(A) Qualifications and Duties of the Structural Engineer

The National Building Code of India (NBC) was published in 1970, and its first revision in 1983. I understand that the publication of the second revision is being planned now, some 20 years later.

The main objective of the NBC is the unification of building regulations throughout the country for use by PWDs, Municipalities and other public bodies.

An area of considerable concern is the coverage given to qualifications and perceived duties of the structural engineer in Part II (Administration) of the NBC. The whole approach is geared towards a single person or agency being responsible for design as well as construction, which would be applicable only for very small projects. For present-day projects of some size the supervision agency is usually different and in many cases is a firm of Construction Management Consultants. This idea needs to be addressed clearly in the main text and appendices of the NBC.

(B) Computer-Aided Structural Design

As in most spheres of human endeavour, computers have made a fundamental change in the practice of structural engineering design. Before the era of computers, individual steps in the design process were executed manually with a slide-rule or calculator which carried the burden of arithmetical operations. Even today the process of computer-aided design is essentially based on “computation by parts” within an overall manual environment. However, as a result of the IT revolution, we are hurtling towards a complete computerisation of the whole process where the entire structural design will become one “seamless” digital activity. Once the structural conception has been made and converted into a form recognised by the computer, it can be prompted through the intermediate steps by a single software package to yield the final drawings for execution at site. Without getting into the significant advantages of computerisation and the impetus it has given to the rapid advancements in structural design, let us look at the downside. Safe structural design in the past has been a direct result of the skill and competence of the engineer. Today excessive number-crunching and large inputs and outputs often obscure the validity of the results. A loss of “structural feel” can lead to mistakes that could yield structures whose safety and economy become unpredictable.

Guidelines for computer-aided design have become imperative to channelise structural design efforts so that it becomes a safe and reliable professional activity.

A protocol needs to be devised so that each of the four steps in the process i.e conception, analysis, design and drawings becomes wholesome. The methodology to be adopted for structural design as well as for peer review needs urgent attention.

(C) Fire Resistance of Structures

A welcome addition in the new IS:456-2000 is a whole chapter on Fire Resistance, wherein fire resistance (in hours) for different structural components have been related to structural detailing of reinforced concrete. Additional measures such as application of fire-resistant finishes and false ceilings have been recommended to obtain the required fire rating.

Unfortunately the picture is rather dismal in the case of structural steel buildings, which are being designed and constructed seldom catering to fire-resistance. IS:800-1984 has only one sentence of significance in appendix G wherein information relating to “grade of fire resistance appropriate to the occupancy as

maybe required" is recommended to be furnished to the steelwork designer. Incidentally, these recommendations are not necessary for purposes of compliance with the code. Also "steelwork designer" has been identified as an individual different from the "building designer" of the project, without defining what are the responsibilities of either of these two individuals.

Reverting back to the National Building Code, the fire resistance ratings required for various building components of a diverse nature of structures needs to be defined more clearly than presently available in Part IV (Fire Protection). The information given in Table 1 of the same needs to be reviewed for roof construction as it gives the impression that there is no requirement of fire resistance once the height exceeds 6.7m. As a consequence, even aircraft hangars in structural steel housing assets worth millions are being designed and constructed in India without any consideration of fire resistance.

As per modern day practice, the required fire rating of a structural component is dependent on the provisions of fire suppression and fire alarm systems as well as on the occupation and contents of the buildings. Comprehensive guidelines dealing with design provisions relating to "fire engineering" of structures, needs to be disseminated widely.

(D) Professional Indemnity

Structural Engineers are taking risks much beyond even their own comprehension. Agreements with clients often carry clauses where the structural engineer is fully responsible without limitation in every conceivable manner for design defects and consequences thereof. Such eventualities can only be covered by professional indemnity insurance.

It is a sad commentary when you look at what is available in India in this regard. The private players have still not entered the field. The Government through its nationalised companies has a standard format titled insurance for "Architects, Interior Decorators and Consulting Engineers". Nothing of essence is covered. It could be a dry cleaner's bill for all the value it holds for a consulting engineer. Despite several attempts we have not been able to get an actual policy in hand even when we have got the coverage done for a specific project. However, they do part, very reluctantly with a receipt of the premium paid.

Have any of the participants better luck in this regard?

K. N. Chandrashekar [Fri Aug 30 19:08:01 2002]

I'm having 26 years of post Graduate experience and am willing to offer such help to any body wanting it!

K.N.CHANDRASHEKARAN

Alpa Sheth [Fri Aug 30 19:08:04 2002]

Dear Kiran and All,

That was a lovely email outlining what we should expect from young engineers. Quite often in consulting firms there is simply no time for training engineers and we, perhaps unfairly, expect them to know everything when they arrive fresh out of school. I am guilty of that too and I think we need to introspect as consultants and see how we can change this. Thanks for reminding us what engineers colleges are for- "to build the abilities to define and solve a problem when one is encountered." My only concern is that many colleges have forgotten that themselves - AND we end up having a stock of engineers who are neither trained to do what you have articulated so well nor can they attend to the day-to-day issues of structural engineering. That is what we need to address.

Regards,

Alpa

Amod Mani Dixit [Fri Aug 30 19:43:01 2002]

Dear all,

Fact 1

After 19 years of service with the government, and at the age of 47 years, I continued to be regarded as "young" (and "enjoy" all the consequences the concept usually has in a developing country!). It was because I did not get a promotion simply because there was no opening.

Some five years later, as a director of a private consulting firm, I found myself negotiating with a MIT prof. who wanted to get one of his Master-level students (preparing his thesis) on-board a project (for Nepal) that we were designing (with our partners) in California. I was overwhelmed by the way the professor (American) was making a case for his student (from Canada) to be included into the project. The student was, no doubt, very smart, and there was no reason for me to say "no" to his inclusion into the team. However, the more the professor

insisted, the more I started remembering some of the young professionals in Nepal. Ultimately, we ended up taking in the Nepalese professional, who did a wonderful job satisfactory to everybody. Currently, this Nepali professional is a noted expert at home and abroad. The Canadian "student" is now also an international expert (4 years after his Master's degree) who works with a reputed international company.

I will never forget the way the MIT professor and the President of my partnering American non-profit company encouraged (provided opportunities, fought for and so on) the young engineer. It was really a great pleasure to see such approach.

Lesson: Learn from Professors of advance countries how to encourage young engineers and create the right opportunities for them. It pays in the long run, both ways.

Fact 2

Back in 1992, the Building Code Development Project of Nepal had the privilege of spotting a young engineer, fresh from the institute, in the team of one of the constituent consultants. This guy had all the potentials except that he did not have much voice (not only because he was young, but also because he came from a not-so-well to do and not - so - well -connected family. He had to struggle hard, all himself, before he could get some opportunity to take some deep breath. Now he is one of the better-known structural engineers of Nepal (but still has to go to a university to get a paper certifying that he knows what he knows). We were so proud that Prof. Sudhir Jain appreciated the approach of this "young" engineer from Nepal in his speech in a workshop dedicated to the anniversary of the Bhuj Eq.

There are several other examples of young engineers of Nepal. In fact these are the people who do the real work of NSET.

Lesson: Look down (and laterally, occasionally) for pearls; look up for garbage!

Bitter Fact 3

Want it or not, or accept it or not, quite some of the students in the engineering classes yet till date belong mostly to the families who want their wards to be the engineers (and not because he has an aptitude). These are the guys who are "destined, in due course of time" to be the occupying the principal positions, to make decisions, and even to push science & engineering "forward"!. These are the people who are the sources of at least some of the problems being discussed

in this conference.

Lesson: Mr. Akela is right, so look into his suggestions seriously. But "Dokela" may be deceiving! Curtail him!

I hope things make sense.

Regards,

Amod

Amod Mani Dixit [Fri Aug 30 20:23:01 2002]

Dear all!

- 1) Facilitate the young engineers.
- 2) Allow them an equal chance, in national or international market (we the regional/national may not have the equal chance, though), and see how they marvel!

- 2) Give them some time, some opportunity, some training, some education, and strictly demand results. They will give you something more than you could expect or anticipate, or manage, and hence, they are, perhaps, better than we guys were!

Can we get a national consensus on this issue?

Regards,
Amod

Shekhar Ghate [Fri Aug 30 20:24:01 2002]

Dear Bhagawat

Mr Oak has developed web site for struct engrs for ISSE. FORTNIGHTLY QUIZ has also started. even general Q/A re relevant struct/civil engg problems /issues also were started unfortunately v. few were aware of this. & still v. few hit the site.

REGARDS

SHEKHAR GHATE

Shekhar Ghate [Fri Aug 30 20:24:05 2002]

Dear M r Ghosh

Yr suggestion re." young engineers meet once in a year in a friendly environment so that they can share their work experience. is v. good. i would like try arrange similar 1 in bombay. thru Instt of Engrs / ISSE. i would appreciate if u give some more info.

regards

Shekhar Ghate

Verma, Navin [Fri Aug 30 20:52:00 2002]

Dear Friends,

I have been following the proceedings of e-conference off and on. It was heartening to see email of Kiran Akella and I fully agree with him. I am also a young structural engineer with little more than 1 year experience. Presently, I am working in United States. I am not too aware of structural engineering work environment in India / bashing of young professionals. But, its little different here. First year of your job is more of a training ground / gestation period and your mistakes are full ignored and what is given importance is your willingness to learn, take initiatives and problem solving approach. We all understand that structural engineering, by its virtue, cannot be learnt in schools and requires training, which can only come by experience. We young people are ready to learn from experiences of senior people. But what I have felt in last year is sometimes senior people develop ways of doing things in their own way and thus obstruct free thinking. If you approach them with a problem, the answer is more like "DO THIS IN THIS PARTICULAR FASHION", instead of provoking you to think after giving some directions / guidelines. I agree that project schedules might force to finish a job quickly at times but this doesn't do any good to us.

As far as training is concerned, I feel our analysis and design courses are adequate to give the fundamental tools to handle any problem. But I do see a need for a course on "construction practices" and "connection design". But this can be accomplished as a continuing education course / some seminars in the company.

Moreover, as has been pointed out by several people about using computer tools / techniques. I don't see any problem in using them as long as we make use of computers as a tool and not as a black box with "garbage in, garbage out" kind of

thing. And, I have to say that with the increasing emphasis on computer literacy in engineering curriculum, we young people are much better in utilizing computer tools efficiently / quickly. So our senior fellows should be ready to make use of these skills of ours in the best execution of a project.

Thanks

Navin Verma

N. N. Javdekar [Fri Aug 30 20:54:00 2002]

Dear Dr Jain,

The e-conference ,your brainchild is proceeding very well, with each participant getting an opportunity to put forth one's views. I feel a consensus is emerging that a "TQM" approach is needed where,

- 1]Top Level commitment,
- 2]Total involvement at all levels, &
- 3]Continuous training , are the main requirements.

With several stakeholders in the process of the business of Civil Engineering / Built Environment {the owner-architect-engineer[structural/services designers]-contractor-material suppliers-project manager/engineer-financer-buyer / user...might represent the general stakeholders},the chain of internal customer-supplier relationships is as strong as only the weakest link. For structural engineers to be proudly& profitably engaged continuously in their profession, they must have an agreed Design Brief which must be within professional and legal framework limits and then they must satisfy the customer. And they must understand the market trends and search for new markets and innovate continuously, in the pursuit of excellence. In this Internet era, global markets must be explored by those who can compete on the basis of their professional strengths and experience. Networking should be the password, with so much Resident/NRI talent available. There must be a will to share knowledge to create dreams in concrete/steel, and generate wealth to be shared..

Educating the decision makers /facilitators to obtain the desired professional standards of global levels, would be an immediate important activity.. as the necessary outcome of this e-conference .

With increasing High Rises dotting our urban skies and deeper foundations mostly on piles in cities like Mumbai/Navi Mumbai, seismic forces must dominate the Design Brief without any compromise. The BIS is mandatory. not optional...or is it ?, One is not sure seeing the fact that even after having gone

Metric for over 40 years , the Government/Semi Govt bodies jon the builders in advertising houses with Areas stated in Square Feet[& not in SqMeters,] and land being measured in different units like cents, gunthas, bighas, yards instead of Sq Meters/Hectares,. and the state govt has ready reckoners in those illegal units..!

There is a lot to be done.. waiting for the fraternity to start doing.

Regards,

N N Javdekar

Arvind [Fri Aug 30 20:54:04 2002]

Dear Dr. Sudhir K Jain & Prof Mahesh Tandon,

Validation of structural Softwares which are sold in the market, is a long felt need, and there is no agency which has come forward to do this job till date.

Many software manufacturers say lot of things in their brochures, but when you actually buy them you find many items missing from the assured list. Is there any way to check them?

With warm regards.....Arvind

M. Hariharan [Fri Aug 30 22:51:01 2002]

Some feedbacks on the issues:

(a) Continuing Education:

Any continuing education program should be structured, and should only be conducted by professional bodies - Educational institutes, Public sector organisations, Professional bodies etc, not as freelance lectures/PPT slides distributed freely. They will lose the seriousness.

(b) Conferences, camps and workshops

Camps and workshops really form part of continuing exercise. In today's world, considering costs and the utility, I am not very encouraged by Conferences in general and in India in particular. Shortcomings are:

- The quality of papers is not very high
- Most papers are too academic, by research scholars who have less knowledge about practical considerations

- Practitioners do not get time or motivation to write papers
- There is always such a short time limit for presentation that no worthwhile discussion takes place.

e-conferences, or a discussion forum, on the other hand, provide for a lot of interaction. There is no time limit (within a time frame, of course). This should be combined with a publishing forum discussed earlier by others, which will give opportunity for presentation of full papers. If everything is conducted electronically, the operating costs will be minimal, and dissemination would be more.

(e) Mentorship

I believe this should be made on a personal level, and possibly cannot be expected as a standard practice. I get mails from my past colleagues working elsewhere, asking for my opinion, feedback, or just a 'how to do'. The mails are copied to other friends as well. Responses can be from me or any of the friends, and will go to everyone. This disseminates information. I have learnt quite a few new things in this exchange. (This is to say that seniors need not necessarily know everything). A discussion forum may be more appropriate. Please visit SEAINT I had written about earlier.

(f) Teaching Institutes

Most teaching Institutes are privately owned and operated. There is a severe shortage of capable staff. The better ones are making do with retired professionals, part timers and the like.

The All India Council for Technical Education (AICTE) has a separate set up called the National Board for Accreditation (NBA). I think it is mandatory for every teaching institute to get the approval of AICTE to first come into existence. It is now mandatory for every institute (and every course in that institute) to be evaluated and accredited by NBA within 5 years. This is somewhat like ISO 9001 Quality Accreditation for the Industry. This is a serious exercise, and I have been part of it for a couple of institutes. The courses are graded A, B, C or Not accredited.

I think the number of Engineering colleges in the country should first be halved. Most of them have come up in the last five years, with the aim of only making money, and "Software" in all its metamorphic forms as the courses. That craze for software has dried. Incidentally, no one has talked about the software industry hijacking engineers and making them do work for which a much lower calibre person is adequate. Only a few fleeting references were made.

(g) Resource database for Engineers

Points (a) and (b) above are related to this. One point that may need to be considered is the confidentiality of some data - Clients may not want their information made public.

Dr. M. Hariharan

M. Hariharan [Fri Aug 30 22:51:05 2002]

This contractually not correct. The applicable code shall always be the one in force at the time of issue of the tender document. (Some people may extend it to the time of submission of the priced bids). The incorporation of more recent codes into a contract can be the client's prerogative, provided he compensates the contractor/designer for cost and time. What is the provision in statutory bodies?

M. Hariharan

M. Hariharan [Fri Aug 30 22:51:08 2002]

kiran akella wrote:

“Please Stop Young Engineer Bashing”

This is from an older engineer.

1. The young (read fresh from college) engineers are not taught practical, design related things in college. Reason is that their teachers themselves may not have done practical designs. The young engineers are not to blame. These are taught / learnt in the profession. However, it is the considered opinion of most practicing engineers that the courses taught are only theoretical, and that is not enough. Incidentally, some students who came to India from abroad on exchange programs also expressed a similar view. Their courses were more practical.
2. The theoretical knowledge / computer knowledge taught in college does not give capacity for "lateral thinking" as you put it. "Lateral thinking" comes with experience.
3. No senior should expect the new entrant to know all code provisions or practical details. However, it is a crime if he/she doesn't know these after a couple of years of experience. A "Good" senior will not bully the youngsters, but will guide them.

4. Computer is not everything. I have been using computers since early 70's for all analysis / design work. Still, I do not encourage young engineers to approach a computer till they have performed a preliminary design by hand, understood the load flow, and overall behaviour of the structure. The computer is then used to optimise the design, document the results etc. Without the hand calculations, you will never know if the results are reliable or not. Incidentally, an approximate design can be performed in a very short time compared to computer coding. (This is valid for large structures, not for isolated footings and the like).

5. "A person with a reasonable aptitude can gain the required specific knowledge anytime.". In the industry, experience has a lot of value. It is very necessary for troubleshooting. The first years in the industry are specifically intended to impart such knowledge. This is well understood and followed in Public sector engineering organisations, but I am not sure of the status in the private sector.

M. Hariharan

Sameer Sajjad [Fri Aug 30 22:51:12 2002]

Dear Prof. Jain,

Thank you for giving me the opportunity to participate in this e-conference. I wish all success for this commendable endeavor. Ideas put forward by several fellow participants have been quite valuable and enlightening.

In recent years, southern state of Kerala, where threat of an earthquake was considered to be remote, experienced tremors of significant intensity. There was wide-spread phenomenon of "sinking of wells" and "boiling water in wells". However, to my knowledge, there has not been adequate scientific investigation into the causes of these phenomena. A proper study might change seismic zoning of Kerala in Indian seismic codes.

Most practicing engineers in Kerala, including Masters Degree holders in Structural engineering, have limited knowledge of aseismic design and construction practices, since seismic engineering/earthquake resistant design is not part of even Masters Degree Curriculum in universities of Kerala.

Therefore, in my opinion, there should be opportunity for Continuing Education in Earthquake Engineering for practising engineers. Intensive short-term courses tailored for practicing professionals could serve the purpose.

I also share the idea of many participants that licensing examination to practise as Earthquake Resistant Design Consultants should be introduced. Allowing structural Engineers without formal education in seismic engineering to practise as a consultants in earthquake resistant design and construction practices could do more harm.

with regards,

Sajjad Sameer,

Arvind [Fri Aug 30 22:53:01 2002]

Dear Dr Sudhir Jain,

I am producing excerpts from an article for your kind attention:

By P.V. Indiresan

"A.P.J. Abdul Kalam is President of India. Undoubtedly, his selection has caused deep misgivings both among a section of politicians and media. One objection that has been repeated ad nauseum is that Dr. kalam is only an engineer. Few of those critics have paused to ponder that such an objection is an insult to the engineering profession.

Few politicians command much respect these days. Yet, if media, comments were to be believed, when it comes to teh highest position of honour in the country, barely literate, even a shady politicians are to be preferred to successful engineers. That reveals a contemptuously low opinion of engineers.

Why is it that virtually every youngster would love to enter an engineering college, and yet, why do so many abuse the profession the way they do? Probably, that is because every engineering advance comes with two unavoidable defects: One, it makes existing practices obsolete, and hence destroys the careers of those who have invested a lifetime in acquiring those skills. Such losers are naturally made unhappy. Two, every engineering advance disturbs the environment. That raises the hackles of the conservationists who believe in Ram Rajya, who have religious faith that the past was better than the present.

It is simple shift from opposition to dislocation caused by engineering advances to suspicion about the character of engineers. In addition, it is safe to abuse engineers. As a class, they are tounge-tied. Their communication skills are very poor. Have you ever heard of an engineer being invited to a discussion or debate

by the media? Engineers are never asked to present their point of view but others are brought in to do so on their behalf.

.....Engineers need not be offered more than what they deserve, but it would be not only just but wise to give them their due.and so on."

This has appeared in HINDU 31.07.2002

With warm regards.....Arvind

G. C. Oak [Fri Aug 30 23:44:01 2002]

Dear Colleagues,

This E-mail is not for boasting about me, as I know very well that my contribution is very humble. This is for triggering and boosting your actions towards betterment of Structural Engineering Profession. You are more gifted, more energetic, more knowledgeable, more capable than me and therefore you would do much better than me for providing solutions to the lacunae of present system. The present system consists of interconnected links of OWNERS - BUILDERS - ARCHITECTS - MUNICIPAL CORPORATIONS - OWNERSHIP ACT - STATUTORY REQUIREMENTS and the STRUCTURAL ENGINEER himself. The system gives rise to peer pressures for compromises by the structural engineers. This rotting has to be minimised if cannot be eliminated. Individually, the Structural Engineers also need uplifting. For which there should ample avenues and also intimation about the same. My humble contribution:

A] UPLIFTING OF STR. ENGR:

I have created and am maintaining my website "oakfreehelp.com" which is singlehanded effort for providing free help by E-media, some useful library material, business help, sharpening of tech. commonsense etc. There juniors can also get lot of guidance, free of cost. Seniors are welcome for giving "Matured Wisdom", can participate in "Fortnight Forum" etc. Basically this concept is " E Development Centre" If you like the site and concept of the site, kindly join me in the welfare efforts.

B] IMPROVING THE SYSTEM

I am active member of Indian Society of Structural Engineers, as Honorary Trustee and also editor of our quarterly journal. ISSE is a wonderful forum for all of us. Presently we have more than 500 members, mostly from Maharashtra. ISSE in last 3 years have made commendable efforts in various aspects. If you desire

to improve SYSTEM, collective efforts will be needed. For your initiative, what better forum can be than ISSE?

If you want something, should not you give something? LET US ACT, AND NOT ONLY DESIRE!

Yours truly

G.C.OAK