The Civil Engineer

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OUR INTELLECTURAL PILLARS

The Institution of Civil Engineers (India)

The Civil Engineer News Letter is the Official Publication of The Institution of Civil Engineers (India).

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Chairman of the Institution
Er. S. L. Swamy

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E-Mail : Info@ice.net.in
Website : www.ice.net.in

Editorial Board

In This Issue...

The Institution of Civil Engineers (India)

From the Editor-in-Chief's Desk

This is the last issue of the News Letter "The Civil Engineer" in the current year. During the various issues of the News Letter in 2009, we dealt with variety of subjects relating to Civil Engineering & Architectural Engineering. This News Letter is a participative venture. We want the Faculty at our Students Chapter and the candidates registered with us to contribute to enrich the News Letter further.

The various appeals for contribution of articles made from time to time in the News Letter have not yielded the desired results and therefore I want to impress upon this point with the genuine hope that it will receive positive response from all the Readers.

ICE(I) is conducting its 4th Examination in December,2009, as per Date Sheet announced. I am sure the candidates are working hard to prepare for the Examination. I wish them success and bright future.

In the previous issue of "The Civil Engineer" we had included an article on "Civil Engineering-A Multidimensional Discipline". While discussing the important areas of Civil Engineering, the article mentioned about General Civil Engineering, Construction Engineering & Geotechnical Engineering etc. Behind every type of Engineering discipline there is a central figure and his team to achieve the desired goal.

In this issue we have an article on "Pivotal Role of Structural Engineer in Structural Engineering" which deals with the subject in details. We shall be taking up the other areas in a phased manner. Similarly there is an article on "Architectural Engineering" which discusses the rapid advancement in construction technology, new materials and complex techniques of design and construction. Finally there is a article on "Vision for Civil Engineering" which depicts the vision of International Summit on the future of Civil Engineering. This would give an idea as to the present thinking about the futuristic role of engineering in the coming years. We want our candidates to remain fully motivated and therefore a small article on A to Z of motivation has also been included.

As stated earlier this being be last issue of "The Civil Engineer" this year, I take this opportunity to wish you all a very bright and prosperous New Year- 2010.

Er. S.L. Swamy
Chairman, ICE(I)

Most people are Just trying to get through the day. Sophisticated people learn how to get from the day.

From the Editor's Pen

Directive Principles of State Policy are enshrined in our constitution. These provisions set out in Part-IV of the constitution are not enforceable by the courts. They are guidelines for the framing of the law by the government. The Directive Principles of State Policy stipulated that the State shall ensure free and compulsory education for children between the age 6-14. This provision like other provisions is just a direction to the State and not a Right like other Fundamental Rights.

The Fundamental Rights are defined as the basic Human Rights of all citizens. These Rights defined in Part-III of the constitution apply irrespective of race, place of birth, religion, caste, creed or gender. They are enforceable by the courts subject to specific restrictions.

The Parliament on 04.08.2009 gave a nod to the Right to Education Bill that not only ensures free and compulsory education to all children aged between 6-14 but also make it a Fundamental Right. Such a provision is a harbinger of new era.

It is an historic decision that the Right to Education would find a place in the galaxy of Fundamental Rights. This brings relief to many and surely is a right step to boost literacy in the country. When we have adopted democratic set up of governance and when the government is by the people of the people & for the people, it is very much necessary that the country should have literate electorate.

Besides, in the economic development of the country, everybody has to be participative and surely an educated person can play a vital role. We normally say that when we educate a woman, we educate a family and when we educate a family we educate a society. We are living in a competitive world and global competition is responsible for all the progress that we see around. Mother earth is not going to be the only planet to live in. Life in Moon is being explored and the day is not far, when we shall be inhabiting other planets too.

Education is the vehicle of change-may it be employment or economic development and those who are deprived of it find life without any worth like an animal who only sees rolling of days and nights as usual without any gusto to live life full size. We have to embark upon a bright future and a better tomorrow. Let us drift our energies towards that end & do whatever is within our reach and available.

Prithipal Singh
Secretary, ICE(I)

People have a tremendous capacity for outstanding achievement. There are also many extraordinary capacities that allow them to become high achievers.

Architectural Engineering

World over, there is rapid advancement in construction technology, new materials and complex techniques of design and construction. The Architect with his present training cannot make efficient design unless he understands more closely the various aspects of advanced engineering technology. On the other hand buildings designed by an Engineer though efficient from the point of technology, safety and economy but deficient in terms of aesthetics and functional requirements.

Even so, there are some excellent examples in the recent past, when civil and structural engineers have worked as both Architects and Engineers. Nervi from Italy Candela from Mexico and Buckminster Fuller from U.S.A., who can really be called master builders though basically Engineers.

It is understandable that Architecture and Engineering play complementary roles from conception to construction. Architectural Engineering deals primarily with the properties and characteristics of building materials and components, and with the design of structural systems for buildings.

Fortunately some Institutions like The Institution of Civil Engineers (India),
The Institution of Engineers (India) & Architectural Engineering Institute of American Society of Civil Engineers (U.S.A.) has given a lead by setting up a new division of Architectural Engineering in their curriculum to meet the urgent need for the creation of a new cadre of competent Architectural Engineers, who can be proficient both in architecture as well as engineering and can thus design and execute structures with an integrated approach. This branch of engineering is integrating knowledge and development in aesthetics, technological and managerial disciplines as applied to buildings.

The term architectural engineering is used to indicate a field embracing all the engineering aspects of building design, including Mechanical and Electrical equipment, acoustics, illumination, air conditioning, safety measures and layout. When used in this broader sense, Architectural Engineering connotes building structure as its specialty.

Architectural Engineer

An Architectural Engineer applies the skills of many engineering disciplines to the design, construction, operation, maintenance, and renovation of buildings while paying attention to their impacts on the surrounding environment.

In countries such as Canada, the UK and Australia, Architectural Engineering is more commonly known as Building Engineering, often "Building Systems Engineering" or "Building Services Engineering" are similar to some Architectural Engineering specializations. In some languages, such as Korean, "Architect" is literally translated as "Architectural Engineer".

****The views expressed by the author are his own***

JUNAID UL HAQUE
B.Sc., M.I.E. (Arch. Engg.)
M.I.C.E. (India), F.I.V. (India), M.I.A.E. (Hong Kong)
Chartered Architectural Engineer & Govt. Approved Valuer

Vision for Civil Engineering

A Summit on the Future of Civil Engineering was convened. A highly-varied group of Civil Engineers, Engineers from other disciplines, educators association and society executives and other leaders, including participants from eight countries outside the United States, attended the Summit. All participants gathered in Landsdowne, Virginia from June 21 to 23,2006.

The Summit on the Future of Civil Engineering in 2025 proved to be a stimulating, uplifting, collaborative, and creative experience for participants. Breakout groups generated wide-ranging discussions, and post-Summit synthesis of their ideas yielded the final vision.

Near the end of the Summit, each of six breakout groups were asked to draft an aspirational vision drawing heavily on ideas and information shared during the Summit. These vision statements were used later by the Summit organizers to create a single vision. Presented here are the visions developed by the breakout groups, edited for consistency, clarity, and brevity.

Vision 1

When Civil Engineers talk, people listen, because Civil Engineers are professionals :

- Trusted by global society to bring technology and people together to build a better world.
- Recognized as competent decision-makers and advisors for creating and maintaining a superior quality of life, and
- Seen as the designers and constructors of the built environment, protectors of the natural environment, shapers of public policy, and leaders in the global quest toward the imagined future.

Vision 2

Civil Engineers create a sustainable global community by :

- **Being** ethical, compassionate, sensitive, apolitical, diverse, inclusive, flexible, respected, and visionary ;
- **Knowing** the body of knowledge needed to enter the profession and the role of life-long learning; and.
- **Doing,** that is, by leading, collaborating, partnering, communicating, teaming, managing, adapting, persuading, inspiring, developing, and articulating.

Vision 3

Civil Engineers create, utilize, and share appropriate technology that improves the quality of life, meets the needs of diverse populations and cultures, preserves and enhances the natural and built environments, inspires optimism, and establishes them as the partner of choice and collaborative integrator for sustainable progress. Civil Engineers have become sustainability engineers viewed as the Number 1 resource for technical leadership in creating a safer, cleaner, equitable, and sustainable civilization. Civil Engineers facilitate appropriate technology transfer that improves the quality of life while being sensitive to and respectful of diverse cultures and social needs.

Vision 4

Civil Engineers, as a result of their :

- Passionate commitment to public health, safety, and welfare.
- Ethics.
- Technical knowledge and skills.
- Environmental conscientiousness, and
- Innovative and creative outlook.

Lead, collaborate, and advise to contribute significantly to enhancing the quality of life and creating a better world as the master steward of the natural and built environments.

Vision 5

Civil Engineers are the people's engineers who have earned the public's trust for the care and enhancement of the natural and built environments in which society lives and interacts. Civil Engineers are the public's trusted counselor for delivering infrastructure solutions that improve lives in a sustainable manner.

Vision 6

Civil Engineers harmonize and shape the natural and built environment to create a better world.

(Courtesy The Vision for Civil Engineering in 2025 – American Society for Civil Engineers – Virginia)

It is unbelievable that we can repair the basic fabric of society, until people who are willing to work have work. Work organizes life. It gives structure and discipline to life.

Pivotal Role of Structural Engineer in Structural Engineering

Structural engineers analyze, design, plan, and research structural components and structural systems to achieve design goals and ensure the safety and comfort of users or occupants. Their work takes account mainly of safety, technical, economic and environmental concerns, but they may also consider aesthetic and social factors.

Structural engineering is usually considered a specialty discipline within civil engineering, but it can also be studied in its own right. In the US, most practicing structural engineers are currently licensed as civil engineers, but the situation varies from state to state. In the UK, most structural engineers in the building industry are members of the Institution of Structural Engineers rather than the Institution of Civil Engineers.

Typical structures designed by a structural engineer include buildings, towers, stadia and bridges. Other structures such as oil rigs, space satellites, aircraft and ships may also be designed by a structural engineer. Most structural engineers are employed in the construction industry, however there are also structural engineers in the aerospace, automobile and shipbuilding industries. In the construction industry, they work closely with architects, civil engineers, mechanical engineers, electrical engineers, quantity surveyors, and construction managers.

Structural engineers ensure that buildings and bridges are built to be strong enough and stable enough to resist all appropriate structural loads (e.g., gravity, wind, snow, rain, seismic (earthquake), earth pressure, temperature, and traffic) in order to prevent or reduce loss of life or injury. They also design structures to be stiff enough to not deflect or vibrate beyond acceptable limits. Fatigue may be an important consideration for bridges and for aircraft design, or for other structures which experience a large number of stress cycles over their lifetime. Consideration is also given to durability of materials against possible deterioration which may impair performance over the design lifetime.

Education

The education of structural engineers is usually through a civil engineering bachelor's degree, and often a master's degree specializing in structural engineering. The fundamental core subjects for structural engineering are strength of materials or solid mechanics, statics, dynamics, material

science, numerical analysis and conceptual structural design. Reinforced concrete, composite structure, timber, masonry and structural steel designs are the general structural design courses that are introduced in the next level of the education of structural engineering. The structural analysis courses which include structural mechanics, structural dynamics and structural failure analyses are designed to build up the fundamental analysis skills and theories for structural engineering students. At the senior year level or in graduate programs, prestressed concrete design, space frame design for building and aircraft, bridge engineering, civil and aerospace structure rehabilitation and other advanced structural engineering specializations are usually introduced.

Recently in the United States, there have been discussions in the structural engineering community about the knowledge base of structural engineering graduates. Some have called for a master's degree to be the minimum standard for professional licensing as a civil engineer. There is a separate structural engineering undergraduate degree at the University of California, San Diego. Many students who later become structural engineers major in civil, mechanical, or aerospace engineering degree programs, with emphasis in structural engineering. Architectural engineering programs do offer structural emphases, and are often in combined academic departments with civil engineering.

Licensing or chartered status

In the United States, persons practicing structural engineering must be licensed in the state(s) in which they practice as a Civil Engineer. The qualifications for licensure typically include a specified minimum level of practicing experience, as well as the successful completion of a nationally administered examination, and possibly a state-specific examination. For instance, California requires that candidates pass a national exam, written by the National Council of Examiners for Engineers and Surveyors (NCEES), as well as a state-specific exam which includes a seismic portion and a surveying portion. Most states do not have a separate structural engineering license. In California, Washington, Oregon, Nevada and a few other states, there is an additional license or authority for Structural Engineering, obtained after the engineer has obtained a Civil Engineering license and practiced an additional amount of time with the Civil Engineering license. The scope of what may be designed by a Structural Engineer but not by a Civil Engineer without the S.E. license is very limited.

The United Kingdom has one of the oldest professional institutions for structural engineers. Originally founded as the Concrete Institute in 1908, it was renamed the Institution of Structural Engineers (IStructE) in 1922. It now has 22,000 members with branches in 32 countries.

The IStructE is one of several UK professional bodies empowered to grant the title of Chartered Engineer; its members are granted the title of **Chartered Structural Engineer.** The overall process to become chartered begins after graduation from a UK MEng degree, or a BEng with an MSc degree. To qualify as a chartered structural engineer, a graduate needs to go through four years of Initial Professional Development followed by a professional review interview. After passing the interview, the candidate sits an eight hour professional review examination. The election to chartered membership (MIStructE) depends on the examination result. The candidate can register at the Engineering Council UK as a Chartered Structural Engineer once he or she has been elected as a Chartered Member. Legally it is not necessary to be a member of the IStructE when working on structures in the UK, however industry practice, insurance and liabilities dictate that an appropriately qualified engineer be responsible for such work.

(Source : Wikipedia, the free encyclopedia)

A TO Z OF MOTIVATION

A void negative sources, people, places, things and habits.
B elieve in yourself.
C onsider things from every angle.
D on't give up and don't give in.
E njoy life today, yesterday is gone, tomorrow may never come.
F amily and friends are hidden treasures; enjoy their riches.
G ive more than you planned to.
H ang on to your dreams.
I gnore those who try to discourage you.
J ust do it.
K eep trying no matter how hard it seems, it will get easier.
L ove yourself first and most.
M ake it happen.
N ever lie, cheat or steal, always strike a fair deal.
O open your eyes and see things as they really are.
P ractice makes perfect.
Q uitters never win and winners never quit.
R ead, study and learn about everything important in your life.
S top procrastinating.
T ake control of your own destiny.
U nderstand yourself in order to better understand others.
V isualize it.
W ant it more than anything.
E**X** cellerate your efforts.
Y ou are unique of all God's creations, nothing can replace YOU.
Z ero in on your target and go for it !

(Courtesy: Tarun Varshney, (Sr. Officer-HR) HUMBOLDT WEDAG INDIA)

Add to Your Vocabulary

- **Abutment**
  Substructure unit supporting the ends of a bridge and usually, retaining the approach embankment.

- **Acid Brick**
  Chemical-resistant brick made from hard-burned shale, often used as flooring in areas where chemical spills are likely to occur.

- **Cantilever**
  A horizontal projection, such as a balcony or beam supported at one end and unsupported at the other.

- **Caisson Disease**
  An affliction developed by people moving in and out of caissons quickly; also called the bends and decompression sickness.

- **Cellular Concrete**
  A lightweight product consisting of portland cement, cement-pozzolan, cement sand, lime-pozzolan, or lime-sand pastes, or pastes containing blends of these ingredients and having a homogenous void or cell structure, attained with gas forming chemicals or foaming agents. For cellular concretes, containing binder ingredients other than or in addition to portland cement, autoclave curing is usually employed.

- **T M T bars**
  Thermo mechanically treated bars used as reinforcement in R.C.C. have good fire resistance, greater ductility and much greater resistance to corrosion. These are available in Fe 415, Fe 500 & Fe 550 grades.

- **Balusters**
  Small vertical members in a railing used between a top rail and the stair treads.

- **Bracing**
  In a stick-built roof system it is the W-shaped structural member which provides support to the roof rafter. A piece of dimensional lumber or metal, used diagonally on the corner of a home.

- **C T D bars**
  Cold twisted deformed bars are commonly termed as Tor-steel rods used as reinforcement in R.C.C. These are generally available in Fe 415 grade.

- **Cement, Portland (ASTMC150)**
  A powdery substance made by burning, at a high temperature, a mixture of clay and limestone producing lumps called? clinkers? which are ground into a fine powder consisting of hydraulic calcium silicates. For non-portland cements.

Non-Corporate Members, ICE(I)

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Professional Vistas

- **Recognition by Govt. of India, Ministry of Human Resource Development, Department of Higher Education** vide Gazette Notification No. F.24/1/2007-TS.III Dated 06.11.2007.
- **Recognition by All India Council for Technical Education (AICTE)** vide letter No. Eqvi./AB/Gen.Corr./2008-09 dated 16.9.2008.
- **Recognition by Association of Indian Universities (AIU)** vide letter No. EV/III (366)/2008/71 Dated 11.04.2008.
- **Recognition for GATE** by National Coordinating Board-GATE, Deptt. of Education, MHRD, GoI.
- Recognition by the **Union Public Service Commission (UPSC)** New Delhi Vide letter No. F.2/1/2007-EIB Dated 30.06.2008.
- **Recognition by Government of Andhra Pradesh** vide letter No. 10232/EC.2/2008-02 Dated 05.11.2008
- **Recognition by Government of Goa** vide letter No.12/11/87-PER/Vol.II Dated 06.03.2008.
- **Recognition by Government of Meghalaya** vide letter No. FDN.156/2001/249-A Dated 21.08.2008.
- **Recognition by Government of Kerala** vide letter No.3946/GI/08/H. Edn Dated 08.07.2008.
- **Recognition by Government of Nagaland** vide letter No. IT/10-1/04 Dated 30.07.2009
- **Recognition by Government of Uttarakhand, PWD, Pauri Garhwal** vide letter No.1011/20(15) E.A.-Parv./09-10 Dated 06.09.2009.

[TO BE PUBLISHED IN PART-1 SECTION -I OF GAZATTE OF INDIA]

Government of India
Ministry of Human Resource Development
Department of Higher Education
* * * * * *

Shastri Bhawan, New Delhi,
the 6th November, 2007

NOTIFICATION

No.F.24 – 1 / 2007 – TS.III. On the recommendations of the High Level Committee for recognition of Educational Qualifications in its meeting held on 22nd May 2007, the Government of India has decided to give recognition to the Section A & B of Associate Membership course, equivalent to Degree and Part – I & II of Technician Engineers (T) equivalent to Diploma in Civil Engineering and Architecture Engineering Courses conducted by the Institution of Civil Engineers (India), Ludhiana (Punjab) as per syllabus approved by All India Council for Technical Education (AICTE) w.e.f. the academic session 2007 – 2008 for the purpose of employment to the posts and services under Central Government in the appropriate field. It is subject to the conditions that the total number of candidates who can be admitted for the said examination would not exceed the authorized strength of the concerned Institutions with which Institution of Civil Engineers (India), Ludhiana (Punjab) has entered into Memorandum of Understanding (MOUs). A review in respect of recognition of educational qualifications shall be made by Ministry of Human Resource Development after one year through All India Council for Technical Education (AICTE).

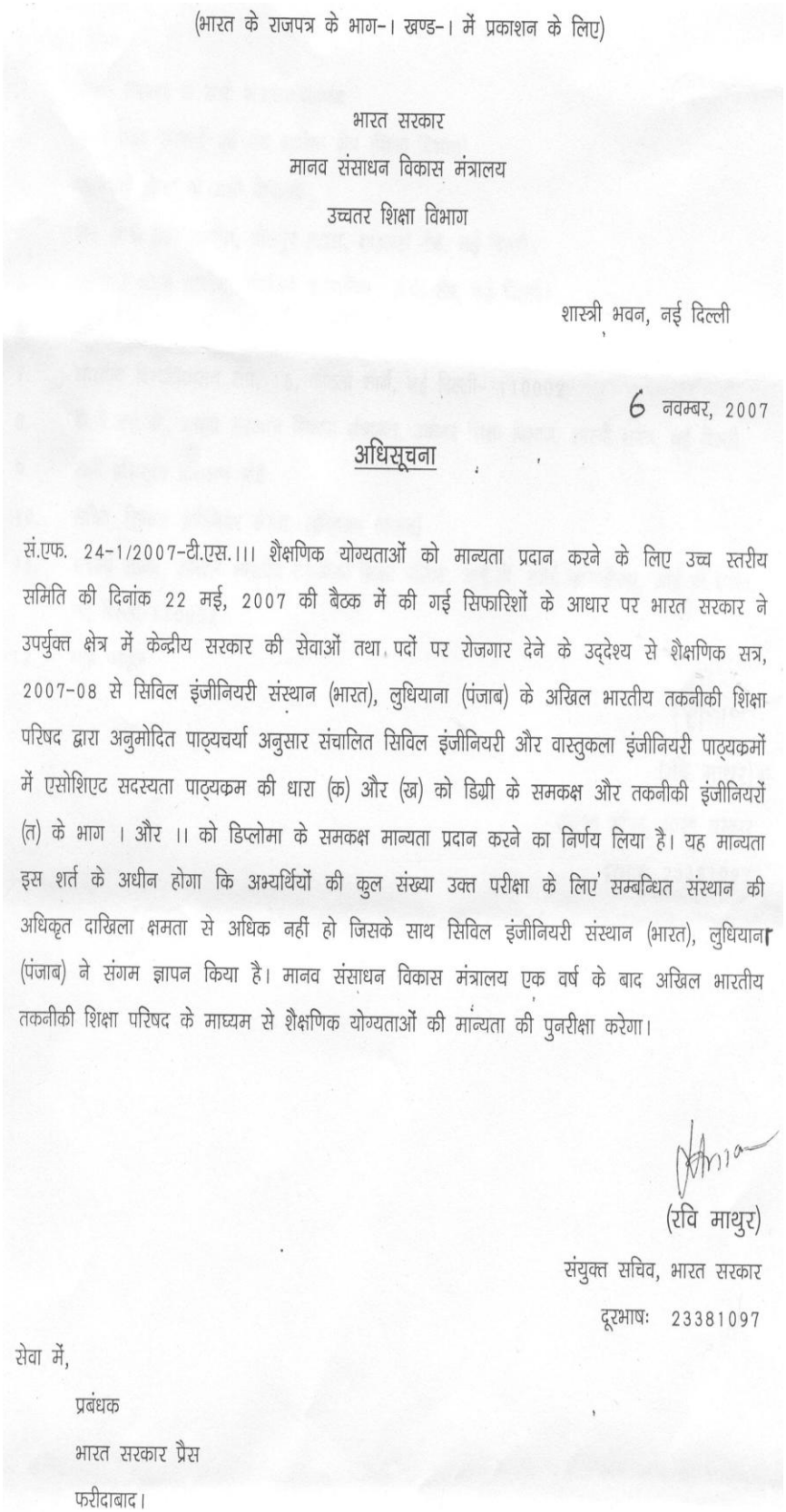
(RAVI MATHUR)
Joint Secretary to the Government of India
Tel: 2338 1097

To

The Manager,
Government of India Press,
Faridabad.

..contd./-

Professional Vistas



(भारत के राजपत्र के भाग-I खण्ड-I में प्रकाशन के लिए)

भारत सरकार

मानव संसाधन विकास मंत्रालय

उच्चतर शिक्षा विभाग

शास्त्री भवन, नई दिल्ली

6 नवम्बर, 2007

अधिसूचना

सं.एफ. 24-1/2007-टी.एस.III शैक्षणिक योग्यताओं को मान्यता प्रदान करने के लिए उच्च स्तरीय समिति की दिनांक 22 मई, 2007 की बैठक में की गई सिफारिशों के आधार पर भारत सरकार ने उपर्युक्त क्षेत्र में केन्द्रीय सरकार की सेवाओं तथा पदों पर रोजगार देने के उद्देश्य से शैक्षणिक सत्र, 2007-08 से सिविल इंजीनियरी संस्थान (भारत), लुधियाना (पंजाब) के अखिल भारतीय तकनीकी शिक्षा परिषद द्वारा अनुमोदित पाठ्यचर्या अनुसार संचालित सिविल इंजीनियरी और वास्तुकला इंजीनियरी पाठ्यक्रमों में एसोशिएट सदस्यता पाठ्यक्रम की धारा (क) और (ख) को डिग्री के समकक्ष और तकनीकी इंजीनियरों (त) के भाग I और II को डिप्लोमा के समकक्ष मान्यता प्रदान करने का निर्णय लिया है। यह मान्यता इस शर्त के अधीन होगा कि अभ्यर्थियों की कुल संख्या उक्त परीक्षा के लिए सम्बन्धित संस्थान की अधिकृत दाखिला क्षमता से अधिक नहीं हो जिसके साथ सिविल इंजीनियरी संस्थान (भारत), लुधियाना (पंजाब) ने संगम ज्ञापन किया है। मानव संसाधन विकास मंत्रालय एक वर्ष के बाद अखिल भारतीय तकनीकी शिक्षा परिषद के माध्यम से शैक्षणिक योग्यताओं की मान्यता की पुनरीक्षा करेगा।

(रवि माथुर)

संयुक्त सचिव, भारत सरकार

दूरभाषः 23381097

सेवा में,

प्रबंधक

भारत सरकार प्रैस

फरीदाबाद।

- **Recognition by Government of National Capital Territory of Delhi** vide letter No.1(1)/2008-DD/SB/1520/5609 Dated 29.10.2008.
- **Recognition by Administration of Daman & Diu (UT)** vide letter No. 10.2 (PART-IV) EST-GP/2008-09/797 Dated 11.11.2008.
- **Recognition by Visvesvaraya Technological University, Karnataka vide letter No. VTU/Aca/OS-GC/2009-10/2118 Dated 04.06.2009**
- **Recognition by CPWD- Central Public Works Department, Government of India** vide letter No.A-12021/1/2006-EC VI/74-75 Dated 19.01.2009.
- **Recognition by Directorate of Technical Education, Haryana** vide letter No.351-53/Dev. Dated 13.06.2008.
- **Recognition by Delhi Development Authority (DDA)** vide letter No.F.7(98)2008/PBI/2399 Dated. 20.08.2008.
- **Recognition by Directorate General Border Roads** vide letter No. 13616/Gen/Rect /DGBR/97/E1A Dated 21.10.2008.
- **Recognition by IRCON INTERNATIONAL LIMITED** vide letter No. IRCON/HRM/31/28/728 Dated 01.09.2008.
- **Recognition by RITES Limited** vide letter No. RITES/RI/RCED/Misc/2008 Dated 14.07.2008.
- **Recognition by Shapoorji Pallonji & Co. Ltd.** vide letter No. Nil Dated 30.10.2008.

Snippets

MEETING OF THE INSTITUTIONAL MEMBER OF ANDHRA PRADESH

The Regional Chapter of ICE(I) in Hyderabad convened a meeting of the Institutional Members of Andhra Pradesh on 31st October,2009 and issues of mutual interests were discussed in the meeting. The members looked forward to a very bright future for ICE(I) programmes in Andhra Pradesh.

We welcome Govt. of Uttarakhand Public Works Depertment, Pauri Garhwal by joining the family of ICE(I) by according their recognition to ICE(I) exams.

5th NATIONAL CONVENTION ON SEAMLESS ENGINEERING EDUCATION FOR BETTER EMPLOYABILITY OF ENGINEERS-POLICY ISSUES

The Engineering Council of India organized **5th National Convention on Seamless Engineering Education for Better Employability of Engineers-Policy Issues** on 30th September, 2009 at New Delhi with the objective of taking in-depth deliberations in the reform of Engineering Education for the better employability of engineers to policy level.

Shri Prithipal Singh Secretary, ICE(I) participated in the above Convention.

The Chairman & Staff of

The Institution of Civil Engineers (India)

wishes a very happy and prosperous

New Year

to all the Corporate & Non-Corporate

Members of the ICE(I) and the readers of the

"Civil Engineer" News Letter of ICE(I)