# **The Civil Engineer**

#### NEWSLETTER

Volume -II, No. 2, March-April, 2011

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# **The Institution of Civil Engineers (India)**

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# The Institution of Civil Engineers (India)



From the Editor-in-Chief's Desk

This issue of the Civil Engineer Newsletter is filled with different shades and colours. Our endeavour has always been to make every issue informative and interesting so that readers not only enjoy the reading of the newsletter, but would also like to preserve the same for future reference.

This issue of the newsletter contains an interesting topic on the "Role of contractors and sub-contractors in a project". "Sustainable development" is a subject which has attracted the attention of the academia and field functionaries world over. ICE(I) is also organizing an International Seminar where the theme is "Approach to Sustainable Futuristic Infrastructure". This seminar will be held on the occasion of the Engineers' Day on 15th September, 2011. We are expecting a large number of academicians par excellence and

Experts from the national and international scene to participate in the seminar.

Again an article on Human Resource challenges faced in the Construction Industry is a topic which gives deep insight of the Construction Industry vis-à-vis the Human Resource challenges. We have discussed different aspects of Engineering in the previous issues. This issue contains an article on "Foundation Engineering" which is a very basic area for any student of Civil Engineering to master.

Other parts of the newsletter contain updated lists of our partners to conduct practicals and guidance for projects as also the usual features. We would continue to provide more and more interesting features in the coming issues. Suggestions and contributions from our readers are most welcome.

With my best wishes.

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

# In order the people may be happy in their work, these three things are needed:

- They must be fit for it.
- They must not do too much of it.
- And they must have a sense of success in it.



#### From the Editor's Pen

As the year passes by events take place every moment and they become part of history. It may relate to an individual or the country. In the present day world, events taking place in one country have direct or indirect impact on others and there emerges the world history. The present day events would be the events of the past, with the passage of time, when present would be more focused and past would be a referral point for comparative study. Good events are enjoyed and tragedies attract sympathies and prayers to Almighty for not their repetition any more.

If we look to the past two months i.e., March and April 2011 we would notice that these months have been very eventful. Cricket mania has involved all and sundry in this country and when India wins the World Cup in 2011 after 1983 how the country would have rejoiced such an occasion can only be seen than imagined. It was a historic event which caught the world eye. Winning event from ones arch rival is a glorious moment to be recorded in Golden letters and rejoiced for years to come.

There was the Tsunami and Earthquake

tragedy in Japan in March 2011 which shook the world. How natural calamity can cause damage to human lives and property which turns decades of progress and development into ashes is a big tragedy which cannot be described in words. Nobody would have predicted such an event nor one wants the repetition of such a tragedy anywhere in the world to witness and share human sufferings.

We have seen the life closely. We know that it is a combination of joy and sorrow. We cannot close our eyes for those things which we do not like. Things will happen as destined whether we are happy or sad and the life will roll on at its speed. If nothing is in our hands, at least God has given us two hands to join in prayer for the welfare of all human beings. Let there be peace, joy and prosperity for everyone so that this world is a beautiful place to live in.

Wishing you all Good Luck.

## Prithipal Singh Secretary, ICE(I)

Work, while you have the light (knowledge, energy and health) You are responsible for the talent that has been entrusted to you.

# THE ROLE OF CONTRACTOR & SUBCONTRACTOR IN A PROJECT



## What is a Contractor ?

Most commonly, the term '**contractor**' is used to describe an expert in the construction industry who hires skilled and unskilled workers to actually construct a financed project. A contractor must be licensed by an examining board before he or she can bid on the project. This bid is based on the estimated cost of the building materials, the wages of subcontractors and laborers and the contractor's fee for coordinating the project.

Although a contractor's main concern is hiring qualified subcontractors (specialized craftsmen paid by the contractor), he or she may also perform some of the construction work as well. develop Most contractors good working with relationships other construction specialists, so they often hire the same specialized companies and workers for each contracted project. The contractor is ultimately responsible for the quality of the work performed by subcontractors, so it doesn't always pay to hire unknown entities to cut down on expenses.

A professional contractor should also have an understanding of his or her limitations. The client works with an architect and finance long before the first shovel of dirt is removed by a contractor. During the bidding process, a contractor may have to work with the building's architect to discuss potential problems with a design element. If the complexity of the building's design or the potential cost overruns, threaten to overwhelm a contractor's skills, he or she needs to step back and allow other contractors to win the bid. A good contractor understands that the success of the project depends on his or her ability to hire the right independent subcontractors and follow the wishes of the client.

In a different sense, a contractor could also be anyone who agrees to perform work for a fee. This occurs frequently in businesses which cannot afford to assign or hire a new employee to perform a specific job. The job itself may not be long-term enough to justify the expenses of a new hire, or the wages may not be sufficient for established employees. Companies in this situation often hire 'independent contractors' to perform the job without a formal employment agreement. The pay rate is discussed with each independent contractor and a legal agreement may be produced. After completing the job, an independent contractor receives the entire amount of pay without tax deductions or other withholdings. At the end of the tax year, the company issues a federal 1099 form showing the independent contractor's miscellaneous income earned.



### What is a Subcontractor?

A subcontractor is a person or a company hired by a general contractor to perform part of the work of a construction job. For example, a contractor might be building a house, but might hire a firm or a person specializing in electrical engineering to install the electrical systems needed in the house. Generally the subcontractor will either relieve the main contractor of part of the building work, or will be able to perform work at lower expense or at a greater skill level than the general contractor could.

Often, a subcontractor, whether an individual or a business, forms relationships with several general contractors. The general contractor working with a subcontractor does not employ the subcontractor as a regular employee in most cases. Instead the subcontractor is either an independent contractor, or is a company that provides its employees with required benefits like health insurance coverage.

Not having to extend benefits to а subcontractor is one way that the general contractor saves money on a job. However, if problems occur because of faulty work on the part of the subcontractor, usually the general contractor is held liable for such problems. The general contractor may attempt to seek redress with the subcontractor, or have defined terms in the contract with a subcontractor stipulating that the liability would be more evenly shared.

Frequently, though, hiring a subcontractor, or several, is a way to avoid problems in construction. Specialized workers like plumbers, electricians, or people who install heating and cooling devices, often called HVAC workers, tend to have more knowledge and training in their given field. While simply building something requires training and knowledge, people who are specialists better perform certain types of work.

The *subcontractor* and the *general contractor* are served well by being able to form good working relationships with each other. For the general contractor, access to a reliable subcontractor can mean finishing jobs on time and on budget. For the subcontractor, a good reputation among contractors means greater opportunities for consistent work.

A subcontractor often holds licenses in his or her specialty field. He or she might hold a general license to conduct work in a state, and also hold advanced licensing. Such licensing implies a certain amount of hours practicing his or her trade and knowledge regarding state building codes.

In some cases, one may also refer to a person hired for a few days of work, without a specialized field as a subcontractor. Really the more accurate term is independent contractor. The person is usually a temporary employee of the contractor, hired to finish work on time, or to temporarily replace another worker who is ill. This type of subcontractor may not have a general contractor's license but may be hired for his or her carpentry skills.

<sup>(</sup>Source : <u>http://civilengineerblog.com/contractor/</u> http://civilengineerblog.com/subcontrctor/

# **CONSTRUCTION INDUSTRY-HUMAN RESOURCE CHALLENGES**



In the present age of science & technology driven economic growth and development, human resource development in Engineering and Technology has assumed an added significance. The enormous escalation of construction activities is being witnessed all over India. The infrastructure sector which transportation, includes power. housing. business and commercial complexes, civic amenities and specialized services require a quality and productivity conscious highly, whose human resource professional capabilities and core competence is of international standards.

The manpower planning should aim at development, utilization, improvement and preservation of human resource of a nation. A nation's competiveness in the present globalized economy will singularly depend upon the competence and caliber of its human resource, as it is the people who matter when it comes to providing efficient and effective services, high productivity and quality based production systems and for developing innovative products and professional services. India fortunately is in an advantageous position to develop world class human resource with its vast infrastructure in science and technology education and research.

Construction industry is one of the key areas of infrastructure development. The construction section is one of the most complex, dynamic yet disorganized sector in our economy. This sector caters to all infrastructural activities.

The construction industry is one of the biggest employers of contract labour in India. NICMAR documents describe construction as "a social institution to change and to modify natural environment to meet the needs and requirement of the civilization at a given point of time".

Rapid development in technology and increasing use of high technology combined with the globalization of economy and the resulting highly competitive environment have created, in developing country like India an urgent need for a substantial increase in technological human resources.

The manpower in science and technology specially in the construction industry reorient itself to meet the challenges of global competitiveness and yet preserve the nature of Indian Architecture.

The emphasis should be on training and retraining the technical personnel as modern technology demands up gradation of knowledge and skills so as to improve the quality of production and products.

An added challenge is the fact that a large number of Engineering graduates are migrating to management, civil services and software jobs. Thus less and less qualified people are available for hard core engineering jobs like manufacturing construction etc. It is therefore necessary for industry to develop its standards to cater to future needs of the challenging global scenario by developing new training systems to upgrade the knowledge and skills of the workers. HRD has to play a vital role in bringing the institutions and the industry together for exchanging their expertise and knowledge in the theory and practice so that a positive improvement in the skill level of the employees can be achieved.

The technical and engineering skills of human capital at all levels i.e. managers, supervisors and workers are crucial for improving productivity. Rapid changes in technology, larger mechanization, emphasis and speed, quality and social concern towards workmen brought focus on the skill formation and improving the existing technical competence. The magnitude of work has been increased many folds with duration of the projects shrinking without compromising on quality. These have led to latest technology transfer from advanced nations.

Development of Human Resource should be focused on

- Developing skills towards building an industrialized nation in the context of meeting the challenges of the new millennium.
- Improve access to better educational facilities, labour market information and new skills.
- Developing skills towards increasing competitive spirit, productivity innovativeness, capability in managing new technologies and self reliance.
- Developing a strong scientific and technical community.
- Reiterate a high moral value and good work ethic community.

- Foster skills such as team work mentoring and leadership as they are as important as technical abilities.
- Create and raise the awareness of the community on the importance of specific skills development in response to the challenges of new millennium and increasingly borderless world economy.
- Establish a mechanism to coordinate and maximize the utilization of available training resources and facilities both in the public and private sector.
- Enhance linkages for technical, vocational and skills training between industries and educational establishments.
- Encourage collection, updation storing and dissemination and use of information on all managerial, technical, vocational and skills training institutions and courses in the country.
- Participation in development activities should be encouraged by empowering them to take decisions suiting to the challenging situation that they may face.

Our ultimate goal should be to sharpen the skills of our workmen and mastering new technologies in order to achieve excellence in any field considering the present requirements of our country.

Contributed by

Ms. Sonali Saxena, HOD (Civil Engg.) ICE(I)

# FOUNDATION ENGINEERING



The foundation is the first part of a building to be constructed. Foundation engineering is the specific branch of engineering that deals with the design and construction of building foundations, as well as foundations for other structures. It requires knowledge of geology, structural engineering and the mechanics of soil and rock.

#### Foundation

• The portion of a structure upon which everything else is built is called the foundation. The purpose of a foundation is to support and distribute the weight of the entire structure evenly, so as to prevent sloping or collapse.

#### Superstructure

• The superstructure is the portion of a structure that is supported by the foundation. This is also the term for any portion of a structure that is constructed above ground. Foundation engineers must take into account the weight and size of the superstructure when designing the foundation.

#### Function

• The function of foundation engineers is to provide a foundation that is capable of supporting a pre-designed superstructure

without overloading the soil and causing a structural failure. Foundation engineers are responsible for determining the type of foundation, be it shallow or deep, best suited to each construction site.

#### **Requirements of foundation :**

A foundation (also called a groundsill) is a structure that transfers loads to the earth. Foundations are generally divided into two categories:

#### Shallow foundation :

Shallow footings are, usually, embedded a meter or so into soil. One common type is the spread footing which consists of strips or pads of concrete (or other materials) which extend below the frost line and transfer the weight from walls and columns to the soil or bedrock. Another common type is the slab-on-grade footing where the weight of the building is transferred to the soil through a concrete slab placed at the surface.

#### **Deep foundation :**

A deep footing is used to transfer a load from a structure through an upper weak layer of soil to a stronger deeper layer of soil. There are different types of deep footings including helical piles, impact driven piles, drilled shafts, caissons, piers, and earth stabilized columns. The naming conventions for different types of footings vary between different engineers. Historically, piles were of wood, later steel, reinforced concrete, and pre-tensioned concrete.



A monopile footing utilizes a single, generally large-diameter, footing structural element to support all the loads (weight, wind, etc.) of a large above-surface structure.

A large number of monopile footings have been utilized in recent years for economically constructing fixed-bottom offshore wind farms in shallow-water subsea locations. For example, a single wind farm off the coast of England went online in 2008 with over 100 turbines, each mounted on a 4.7-meterdiameter monopile footing in ocean depths up to 18 meters of water. An earlier (2002) wind farm in the North Sea west of Denmark utilized 80 large monopiles of 4 meter diameter sunk 25 meters deep into the seabed.

#### **Base-isolating footings**



#### **Base isolation**

Base-isolating footings, also known as seismic or base isolation system, is a collection of structural elements which is intended to substantially decouple a superstructure from its substructure resting on a shaking ground thus protecting a building or non-building structures integrity during a potentially devastating earthquake. The base-isolating system may be constructed on either a shallow footing or a deep footing substructure. The base-isolating footing design is believed to be a powerful tool of contemporary earthquake engineering pertaining to the passive structural vibration control technologies.

#### Design

Footings are designed to have an adequate load capacity with limited settlement by a geotechnical engineer, and the footing itself is designed structurally by a structural engineer.



The primary design concerns are settlement and bearing capacity. When considering settlement, total settlement and differential settlement is normally considered. Differential settlement is when one part of a foundation settles more than another part. This can problems to the structure the cause foundation is supporting. It is necessary that a foundation not be loaded beyond its bearing capacity or the foundation will "fail".

Other design considerations include scour and frost heave. Scour is when flowing water removes supporting soil from around a footing (like a pier supporting a bridge over a river). Frost heave occurs when water in the ground freezes to form ice lenses.

Changes in soil moisture can cause expansive clay to swell and shrink. This swelling can vary across the footing due to seasonal changes or the effects of vegetation removing moisture. The variation in swell can cause the soil to distort, cracking the structure over it. This is a particular problem for house footings in semiarid climates such as South Australia, Southwestern US, Turkey, Israel, Iran and South Africa where wet winters are followed by hot dry summers. Raft slabs with inherent stiffness have been developed in Australia with capabilities to resist this movement.

When structures are built in areas of permafrost, special consideration must be given to the thermal effect the structure will have on the permafrost. Generally, the structure is designed in a way that tries to prevent the permafrost from melting.

#### **Foundation Engineering**

a) Interference effect of footings and anchors A new laboratory set up has been designed to determine the interference effect of a number of footings and anchors. In contrast with the available information in literature. the proposed setup requires only one footing/anchor to be used in the setup (Figure). It requires much smaller size of the tank to be used. This setup was successfully used to determine the bearing capacity of a group of footings and anchors in the laboratory.



Figure: Model test setup for determining interference of two footings.

b) Seismic Bearing Capacity of Foundations and Seismic Earth Pressures

Seismic bearing capacity of foundations is evaluated using method of characteristics and finite element method. The bearing capacity factors were developed to account for the reduction in the ultimate bearing capacity on account of earthquakes. Passive earth pressure coefficients were also developed to account for the reduction in the passive resistance on account of earthquakes.

c) Dynamic response of machine foundations

The effect of the employment of the spring mounting base sandwiched in between the machine and its reinforced concrete footing, on the dynamic response of the footing as well as the machine base is explored (Figure). A number of block vibrations tests were carried out for this purpose by using a rotating mass type mechanical oscillator both with and without the spring mounting base. Under steady state vibration condition, the variation of the displacement amplitude of both the footing and machine base was obtained with respect to changes in (i) the frequency and eccentricity angle of the oscillator; and (ii) the stiffness of the springs. Experiments were conducted by employing two different stiffness values of the spring mounting system. The resonant displacement amplitudes of both the footing and the machine were found to become lower with the smaller stiffness value of the springs. The resonant frequency for the machine base, in all the experiments, was found to be invariably the same as that of the footing.



Figure : Experimental set-up of footing and machine with spring mounted base

#### Why do we use Foundation.

If foundation is not provided the stress on the soil due to the building may exceed the bearing capacity of the soil and the structure will fail. Thus, the foundation keeps the load on the soil in allowable range by distributing it on a vast calculated area.

#### Requirements of a foundation.

#### Safety

The foundation must be stable and safe in the first place. Safety of a foundation is ensured:

- 1. By keeping a factor of safety.
- 2. By avoiding structural failure of foundation itself.
- 3. By avoiding the excessive settlements (Total settlement + Differential settlement)

#### Depth requirement:

- Depth should be such that foundation is below seasonal volumetric changes caused by freezing and thawing.
- Depth of foundation should be up to a point where changes of moisture do not occur frequently and abundantly. Erosion should also be prevented and any loose soil should not be underneath foundation e.g. Peat

#### Spacing requirement:

When laying a foundation the surrounding (already existing foundations of adjacent buildings) should also be considered and the new foundation should be built at a distance from it so that the previous one is not affected by digging or excavation.

#### Economy and functionality:

The project of foundation designing must be economical and should fulfill all the requirements, necessities and standards.

Courtesy : Internet

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(6) Truba Institute of Engineering & Information Technology, Karond Gandhi	(1) Sanjay Memorial Institute of Technology, Chandipadar, Via : Bhattakumarada,
Nagar By Pass Road, Bhana, Madhya Bradaah	Orissa
✓ Maharashtra	(2) Gopal Krishna College of Engineering & Technology.
(1) Pravara Rural Engineering College, Loni, A/P. Loni-413736, Tal. Rahata,	I.E.M., Gourahari Vihar, P.ORaniput, Jeypore, Koraput, Odisha-764005
Dist. Ahmednagar, Maharashtra	(3) Orissa Engineering College, Nabajyoti Vihar, Nijigarh Kurki,
(2) Mahatma Gandhi Missions, Jawaharlal Nehru Engineering College, N-6, CIDCO	P.OHarırajpur, Jatnı, Bhubaneswar-752050, Orissa
Aurangabad - 431003, Maharashtra	(8) Suddhananda Engineering & Research Centre,
(3) G.H. Raisoni College of Engineering, CRPF Gate No. 3, Hingna Road, Digdoh Hills,	At-Nachhipur, P.O. : Bhatapatana, Bhubaneswar, Dist : Khurda, Orissa -752115
Nagpur - 440016, Maharashtra	(9) Raja Kishore Chandra Academy of Technology (Polytechnic),
Science,	Balasore-756040, Orissa
Ramtek - 441 106,	✓ Punjab
Nagpur, Maharashtra	(1) Lovely Institute of Technology (Architecture),
(5) Bharati Vidyapeeth University College of	Railway Bridge, Phagwara,
Engineering, Pune-Satara Road	Kapurthala-144402,
Dhankawadi	Punjab (2) Deeb Bhaget Engineering College
Pune - 411043,	Amloh Road, Mandi Gobingarh,
	Punjab
<ul> <li>✓ Orissa</li> <li>(4) Dhaneshwar Rath Institute of Engineering &amp;</li> </ul>	(3) Guru Nanak Dev Engineering College, Gill Road, Ludhiana,
Management Studies,	Punjab
(Diploma Wing), Kairapari, Kotsabi (Tangi), Cuttack - 754022	✓ Rajasthan
Orissa	(1) Sri Balaji College of Engineering &
(5) Krupajal Engineering School	Technology, Ronad Road (Dadi Ka Rhotak)
Prasanti Vihar, Pubasason,Kausalya Ganga	Jaipur - 302013 Raiasthan
Bhubaneswar – 751002	(2) College of Engineering and Technology.
Ulissa (6) KIIT University	Bikaner, Kani Industrial Area,
AT/PO. : KIIT. Bhubaneshwar - 751024	Pugal Road,
Orissa	Bikaner-334005,
(7) Black Diamond College of Engineering &	(3) Aavoian School of Architecture
Technology,	ISI-4. RIICO Institutional Block
Jharsuguda (BDCET)	Sitapura, Goner Road
At : Balijori, L & I Dhutra Road, Jharsuguda, Orissa-768202	Jaipur-302022
011030-700202	Rajasthan



	Uttrakhand	
(1)	Dehradun Institute of Technology,	S.
• •	Mussoorle-Diversion Road,	NO
	P.O Bhagwantpur, Dehradun, Uttrakhand	1.
	√ llttar Pradesh	2.
(4)	Pundalkhand Institute of Engineering 9	3.
(1)	Eundeiknand Institute of Engineering &	4.
	Kennur Deed Ihenei 204420	6
	Kanpur Road, Jhansi - 284128,	
(0)		8.
(2)	Radha Govind Engineering College,	
	Anuyogipuram ,Near Medical College Garn	9.
	Road, Meerut - 250004,	10
	Uttar Pradesh	11
(3)	Gandhi Polytechnic,	
	Muzaffarnagar, Uttar Pradesh	
(4)	Hewett Polytechnic, Lucknow,	
	Mahanagar, Lucknow,	
	Uttar Pradesh	
(5)	Lucknow Polytechnic Lucknow,	
• •	Abhiyantrik Upnivesh,	
	Krishna Nagar, Kanpur Road, Lucknow	
	Uttar Pradesh	
(6)	Sevdie Institute of Management &	
(-)	Technology, (S.I.M.T).	
	Chinhat Deva Road.	
	Lucknow.	
	Uttar Pradesh	
(7)	Devoravag Institute of Technical Studies	
(')	Devoravag Technical Campus, Phanhamau	
	Allahahad Littar Pradesh	
	West Berrol	
	v west bengal	
(1)	North Calcutta Polytechnic,	
	15, G.M. Lane, Kolkata-700002,	
	West Bengal	
(2)	Camellia School of Engineering &	
	Technology,	
	Nadibhag, P.OKajipara, Barasat,	
	Kolkata-700124, West Bengal	
(3)	JIS College of Engineering,	
• •	Block "A" Phase-III, Kalyani, Nadia,	
	West Bengal-741235	
(4)	Rajmati Prichand Bothra Memorial Jiagani	
( )	College of Engineering & Technology	
	(RPBM)	
	At - Hatibhian PO Jiagan	
	Dist. – Murshidabad-742123 West Bengal	
	Bist. Materiadoua 192120, West Deligal	1

ABSTRACT					
State	No. of MoUs		S. No.	State	No. of MoUs
Andhra Pradesh	8		12.	Kerala	2
Assam	2		13.	Madhya Pradesh	6
Bihar	2		14.	Maharashtra	5
Chhattisgarh	1		15.	Orissa	9
Delhi	1		16.	Punjab	3
Gujarat	4		17.	Rajasthan	3
Haryana	5		18.	Uttarakhand	1
Himachal Pradesh	1		19.	Uttar Pradesh	7
Jammu and Kashmir	4		20.	West Bengal	4

Total

74

4 2

Jharkhand

Karnataka

# **Add to Your Vocabulary**

# Faceshell Bedding

In concrete block masonry construction-application of mortar to all vertical and horizontal edges of the face shells of hollow masonry units.

# Hydrologic Cycle

The Hydrologic Cycle consists of the evaporation of water from oceans and bodies other of open water condensation to produce cloud formations; precipitation of rain, snow, sleet or hail upon land surfaces; dissipation of rain or melted solids by direct run-off into lakes and by seepage into the soil. Thereby producing a continuing endless source of water in the sub-grade.

# Fish Belly

A term applied to a girder or a truss having its bottom flange or its bottom chord constructed either haunched or bow-shaped with the convexity downward.

# Foundation Grillage

A construction consisting of steel, timber, or concrete members placed in layers; each layer is normal to those above and below it and the members within a layer are generally parallel, producing a crib or grid-like effect. Grillages are usually placed under very heavy concentrated loads.

# Gap-Graded Aggregate

Aggregate containing particles of both large and small sizes, in which particles of certain intermediate sizes are wholly or substantially absent.

# Indeterminate Stress

A stress induced by the use of a redundant member in a truss or an additional reaction in a beam rendering stress distributions unable to be determined by the principles of statics.

# Inspection Ladders

Special devices or appliances designed to afford a safe and efficient means for making inspections and determine to the physical tests condition of a structure and to facilitate repair operations incident to its maintence; to prevent displacement they will be, in general, rigidly fixed upon the structure, however, certain types of structures are adapted to the use of movable platform devices for suspension from the railings or other parts which are or may be adapted thereto.

# Joist Hanger

A steel section shaped like a stirrup, which is specially bent so it can be fastened to a beam in order to provide end support for joists, headers, etc.

# Fender

A structure that acts as a buffer to protect the portions of a bridge exposed to floating debris and waterborne traffic from collision damage; sometimes called an ice guard in regions with ice flaws.

# Flexural Strength

A property of a solid that indicates its ability to withstand bending.

# **Professional Vistas**

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•	Recognition by Govt. of India, Ministry of Human Resource Development, Department of Higher Education vide Gazette Notification No. F.24/1/2007-TS.III		•	Rec Cap vide 29.
	Dated 06.11.2007.		٠	Re
•	Recognition by Association of Indian			vide
	vide letter No. EV/III (366)/2008/71		٠	Ree
	Dated 11.04.2008.			And
٠	Recognition by All India Council for Technical			vide
	Education (AICTE)			05.
	vide letter No. Eqvi./AB/Gen.Corr./2008-09 Dated		•	Ree
	16.09.2008.			Diu
•	Recognition by Union Public Service			0.9/
	vide letter No. F.2/1/2007-EIB Dated 30. 06.2009.			Re
•	Recognition for GATE by National		-	Dep
	Coordinating Board-Gate, Deptt. of Education,			vide
	MHRD, Gol.			19.
٠	Recognition by Government of Goa		•	Ree
	vide letter No.12/11/87-PER/Vol.II			Uni
	Dated 00.03.2000.			vide
•	Recognition by Directorate of Technical Education Harvana			Dat
	vide letter No.351-53/Dev. Dated 13.06.2008.		•	Ree
•	Recognition by Government of Kerala			VIDE
	vide letter No.3946/GI/08/H. Edn		•	
	Dated 08.07.2008			vide
٠	Recognition by RITES Limited			Dat
	vide letter No. RITES/RI/RCED/Misc/2008 Dated		•	Rec
	14.07.2008.			Dep
٠	Recognition by Delhi Development Authority			Pla
	(DDA) vide letter No E 7(98)2008/PBI/2399, Dated			D.K
	20.08.2008.			
•	Recognition by Government of Meghalava		•	Kec
	vide letter No. FDN 156/2001/249-A Dated			Pu
	21.08.2008.			vide
•	Recognition by IRCON INTERNATIONAL		•	Ru
	LIMITED			(A (
	vide letter No. IRCON/HRM/31/28/728 Dated			vide
	01.09.2008.		<u> </u>	Dat
•	Recognition by Directorate General Border		•	
	ruaus vide letter No. 13616/Gen/Rect /DGRR/97/F14			vide
	Dated 21.10.2008.		L	Dat
1		1 1		

•	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 Shapoorji Pallonji & Co. Ltd.
	vide letter No. Nil Dated 30.10.2008.
•	Recognition by Government of Andhra Pradesh
	vide letter No. 10232/EC.2/2008-02 Dated 05.11.2008.
•	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 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 Visvesvaraya Technological University, Karnataka
	vide letter No. VTU/Aca/OS-GC/2009-10/2118 Dated 04.06.2009
•	
•	Recognition by Government of Nagaland
•	vide letter No. IT/10-1/04 Dated 30.07.2009
•	Recognition by Government of Nagaland vide letter No. IT/10-1/04 Dated 30.07.2009 Recognition by Government of Uttarakhand, PWD, Pauri Garhwal
•	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.AParv./09-10 Dated 06.09.2009.
•	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.AParv./09-10 Dated 06.09.2009. Recognition by Government of Chhattisgarh, Department of Technical Education, Manpower Planning, Science & Technology, Mantralaya, D.K.S Bhavan, Raipur
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- Recognition by Delhi Metro Rail Corporation Ltd.
   vide letter No DMRC/O&M/HR/2010 Dated 20.08.2010
   Recognition by Oil and Natural Gas
- Corporation Ltd. Rectt. Section, Tel Bhawan, Dehradun vide letter No. 7(2)/PR-Rectt./2010 Dated 26.08.2010
- Recognition by Anna University Chennai, Chennai-600025 vide letter No.2664?AU/DD1-DAC/2011/F21 Dated 07.01.2011
- Recognition by Government of West Bengal, Directorate of Technical Education & Training, Kolkata
   vide letter No.728 TET
   Dated 28.03.2011

#### [ 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, the6thNovember, 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).

Dem.

(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-। खण्ड-। 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-धी.एस.।।। 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 सन्न, 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 पाठ्यकर्मो में एसोशिएट सदस्यता पाठ्यकम की धारा (क) और (ख) को डिग्री के समकक्ष और तकनीकी इंजीनियरी (त) के भाग । और ।। 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।

> रिवि माथुर) संयुक्त सचिव, भारत सरकार दूरभाषः 23381097

सेवा में,

प्रबंधक

भारत सरकार पैस

Please visit ICE(I) Notification At MHRD Website : www.education.nic.in/Tech/Recoeduqualfs.pdf



# The Institution of Civil Engineers (India) Date Sheet for Summer -2011 Examination

Date & Day	/ Forenoon Session (10.00 AM to 1.00 PM)		Afternoon Session (2.00 PM to 5.00 PM)		
06-June-11	TC 1.1	Basic Civil Engineering	TC 2.7	Construction Technology	
Monday	TA 1.1	Basic Architectural Engineering	TA 2.1	History of Architecture	
	TC 2.1	Surveying	AC 1.1	Advanced Engineering Mathematics	
	TA 2.7	Surveying and Levelling	AA 1.1	Advanced Engineering Mathematics	
	BC 2.1	Applied Hydraulics and Fluid Machines	BCO 3.1	Advanced Design of Reinforced Concrete Structures	
	BA 2.1	Professional Practice and Arch. Engg.	BCO 3.9	Traffic Engineering	
07 June 11	TO 4 0		BAU 3.2	Rehabilitation of Structures	
	TC 1.2	Technical Writing	TC 2.8	Estimation, Costing and Specifications	
Tuesuay	TA 1.2		TA 2.8	Architectural Design and Graphics	
	TC 2.2	Fluid Mechanics and Machinery	AC 1.2	Advanced Strength of Materials	
	TA 2.2	Free Hand Drawing and Painting	AA 1.2	Advanced Strength of Materials	
	BC 2.2	Machine Foundations	BCO 3.2	Advanced Design of Steel Structures	
	BA 2.2	Finishes, Materials and Specifications	BCO 3.10	Highways and Railways Engineering	
			BCO 3.20	Irrigation Engineering	
			BAO 3.3	Advanced Architectural Design	
08-June-11	TC 1.3	Engineering Physics and Applied	TC 2.9	Civil Engineering Designs	
wednesday	TA 1.3	Engineering Physics and Applied Mechanics	TA 2.9	Building Material and Science	
	TC 2.3	Soil Mechanics	AC 1.3	Computer Progamming and Numerical	
	TA 2.3	Building Construction		Methods	
	BC 2.3	Advanced Reinforced Concrete Design	AA 1.3	Computer Programming and Numerical Methods	
	BA 2.3	Building Services	BCO 3.3	Prestressed Concrete Structures	
			BCO 3.11	Airports, Docks and Harbours	
			BCO 3.21	Ground Water Hydrology	
			BAO 3.4	Interior Design	
09-June-11	TC 1.4	Engineering Mathematics	TC 2.10	Engineering Graphics & Design	
Thursday	TA 1.4	Engineering Mathematics	TA 2.11	Engineering Graphics & Design	
	TC 2.4	Mechanics of Solids	AC 1.4	Foundation Engineering	
	TA 2.4	Structural Mechanics	AA 1.4	Foundation Engineering	
	BC 2.4	Optimization in Structural Design	BCO 3.12	Bridge Engineering	
	BA 2.4	Advanced Structural Design	BAO 3.5	Landscape Architecture	

Date & Day	y Forenoon Session (10.00 AM to 1.00 PM)		Afternoon Session (2.00 PM to 5.00 PM)	
10-June-11	TC 1.5	Engineering Drawing	TC 2.11	Fundamentals of Civil Engineering
Friday	TA 1.5	Engineering Drawing	TA 2.12	Fundamentals of Arch. Engineering
	TC 2.5	Basic Structural Design	AC 1.5	Reinforced Concrete Structures and
	TA 2.5	Theory of Structures		Advanced Concrete Technology
	BC 2.5	Environmental Engineering	AA 1.5	Reinforced Concrete Structures and
	BA 2.5	Environmental Engineering		Advanced Concrete Technology
			BCO 3.14	Pollution and Control Engineering
			BCO 3.24	Water Resource Management
			BAO 3.6	Disaster Management for Buildings
11-June-11	TC 1.6	Engineering Chemistry	AC 1.6	Design of Steel Structures
Saturday	TA 1.6	Engineering Chemistry	AA 1.6	Design of Steel Structures
	TC 2.6	Environmental Engineering	BCO 3.16	Industrial Waste Treatment & Disposal
	TA 2.10	Environmental Engineering	BAO 3.7	Advanced Comp. Application for Arch.
	BCO 3.7	Building Science	BAO 3.8	Climatology and Architecture
	BAO 3.1	Elements of Town Planning and	TA 2.6	Estimation and Costing
		Architecture		

# Notes: -

- a. ICE (I) has the right to change the schedule of paper/s on account of unavoidable circumstances.
- b. Candidates must carry the Membership Card & Admit Card to seek entry to the Examination Hall.
- c. The Examination hall will be opened 15 minutes before the time specified for the commencement of the Examination.
- d. Candidates can be allowed entry to the Exam Hall within 30 minutes of the start of the Exam.
- e. Candidate is not allowed to leave the Examination Hall before the expiry of 60 minutes of the start of the Exam.
- f. Candidates using unfair means shall be dealt with as per rules of ICE(I) in this behalf.
- g. The result of the examination is likely to be declared within eight weeks of the last examination is over.
- h. Candidates are required to bring their own drawing board/instrument box for Engineering Graphics paper.
- i. Only Non-Programmable Calculators and **ORIGINAL** Standard, Design-Data Books, Log Tables are permitted in the Examination Hall.
- j. Candidate is not allowed to carry mobile phones in the Examination Hall.
- k. From Summer 2011 Examination onwards Candidates will be supplied Test Booklet containing objective & subjective types of Questions.

 TC:
 T. Engg. (Civil)
 AC: AMICE(Civil) Section A
 BC:
 AMICE(Civil) Section B
 BCO:
 AMICE(Civil) Section B (Optional)

 TA:
 T. Engg. (Arch.)
 AA:
 AMICE(Arch.) Section A
 BA:
 AMICE(Arch.) Section B
 BAO:
 AMICE(Arch) Section B (Optional)

# SNIPPETS

#### EXECUTIVE COMMITTEE MEETING OF THE ACECC (ASIAN CIVIL ENGINEERING COORDINATING COUNCIL) ON 16TH AND 17TH SEPTEMBER 2011

ICE (I) is a member of the Asian Civil Engineering Coordination Council (ACECC). The 21st meeting of the Executive Committee of the ACECC is being hosted by ICE (I) on the 16th and 17th September, 2011 after the Engineers' Day celebration on 15th September, 2011. It is expected that representatives from more than 10 countries would participate in the Executive Committee Meeting being held in India for the first time.

#### MEETING OF THE ENGINEERING COUNCIL OF INDIA

The meeting of the Engineering Council of India was held on 16th March 2011 at SCOPE Complex, Lodhi Road, New Delhi to consider introduction of National the Proficiency Evaluation Test as an independent assessment of proficiency of young Engineering graduates, Diploma holders as well as Supervisors. Shri Prithipal Singh, Secretary, ICE (I) and Dr. S. D. Sharma, Director (Academic), ICE (I) attended the meeting and participated in the proceedings of the meeting.

# ICE(I) EXAMINATION SCHEDULE FROM JUNE,2011 ONWARDS

ICE(I) has decided to hold Summer Examination from 1<sup>st</sup> Monday of June and Winter Examination from 1<sup>st</sup> Monday of December every year.

#### INTERNATIONAL WORKSHOP ON ADAPTATION AND MITIGATION OPTIONS FOR TRACKING THE IMPACTS OF CLIMATE CHANGE ON WATER <u>RESOURCES</u>

The above workshop was jointly organized by ITM University and UNESCO (United Nations Educational, Scientific and Cultural Organisation) on 14th and 15th March 2011 in Gurgaon. The Workshop was attended by Dr. S. D. Sharma, Director (Academics), ICE(I).

# SNIPPETS

# **ENGINEERS' DAY CELEBRATION ON 15TH SEPTEMBER 2011**

The Institution of Civil Engineers (I) will be celebrating Engineer's Day on 15th September, 2011. ICE (I) will organize.

- (1) International Seminar on "Approach to Sustainable Futuristic Infrastructure",
- (2) Convocation on this day.

The International Seminar will be held in Siri Fort Auditorium, New Delhi followed by Convocation at the same premises.

The theme of the Seminar is "Approach to Sustainable Futuristic Infrastructure". It is expected that a large number of delegates will attend the International Seminar which will attract practicing Civil and Structural Engineers, students, academia and field functionaries.

This is a rare opportunity to present a paper before the national and international delegates.

The corporate and non corporate members who wish to submit the paper should intimate to the Secretary ICE (I) giving necessary details. The theme is knit around many areas of special interest which will be focused in the International Seminar which may include the following:

- Global Warming
- Depletion of Oil Resources
- Deterioration in Environment
- Reduced and polluted water resources
- Damaged Ecological System
- Aging and Overburdened Infrastructure
- Sustainable Construction
- Innovation in Design and New Technologies
- Applications of Information Technology
- Recycling of Resources
- Green Buildings
- Safety and Reliability
- Durability of Material and Structures
- New Construction Materials

It is ICE (I)'s endeavour to draw the finest professionals from all over the world to share their experience and expertise and extend further the frontiers of their excellence across their profession.

Last Date for sending Abstract of the Papers -30<sup>th</sup> June,2011 Submission of CD of Paper after approval -31<sup>st</sup> July,2011

# **OUR SYMPATHIES**

On March 11, 2011 Japan witnessed the greatest ever tragedy that has hit the country since the World War II. Japan was struck by a 9.0 magnitude earthquake followed by a Tsunami. The most affected part was the northeast coast which is now half-submerged in water. The death toll of the tragedy is more than 12,000 with another 15,000 missing. The Radiation from Nuclear Reactor at Fukushima struck by the earthquake and Tsunami is posing serious threat to health, whether directly in the polluted air or water or indirectly through food.

The disaster has left about 450,000 people without homes, and the country with shortages of food, power and gasoline.

Many world leaders including US. President Barack Obama, British Prime Minister David Cameron, French President Nicolas Sarkozy, Chinese Prime Minister Wen Jiabao and the Russian President Dmitry Medvedev have expressed their sympathies and offered to assist the country in its struggle to recover.

U. N. Secretary-General Ban Ki-moon praised Japan as a nation known for helping other countries in need of emergency assistance. "Japan is one of the most generous and strongest benefactors, coming to the assistance of those in need the world over. In that spirit, the United Nations stands by the people of Japan and we will do anything and everything we can at this very difficult time."

The Indian government expressed its sadness over the loss of life and the extensive damage to property and infrastructure.

Loss to human lives and property through such disasters shakes the entire world and the whole mankind comes out to help the survivors in cash or kind as a token of their sympathies for the colossal loss which they have suffered.

ICE (I) offers its heartfelt sympathies to the affected people of Japan and wish for its early recovery.