

Established 1906

# SRI LANKA ENGINEERING NEWS

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## Eng. B.D. Rampala Memorial Lecture

The Institution of Engineers, Sri Lanka commemorated the 101<sup>st</sup> birth anniversary of Late Engineer B.D.Rampala with a memorial lecture at the Wimalasurendra Auditorium of the institution on Tuesday, 20<sup>th</sup> Dec 2011. The lighting of the Oil Lamp and garlanding of the photograph of the late engineer by the President of IESL, Eng. (Dr.) Ananda Ranasinghe preceded the lecture which was delivered by Eng. (Prof.) Amal Kumara, Senior Professor of Civil Engineering, Department of Transport & Logistics Management, University of Moratuwa. The theme of the lecture was 'An Engineering Perspective of the Past, Present and Future of Railways'. Family members of late Eng. B.D.Rampala, General Manager, Sri Lanka Railways, Mr. B.A P Ariyaratne, past General Manager, Eng. Priyal De Silva, staff and students of universities, members of IESL and others connected to the profession were among the well attended audience.

Prof. Kumara, in his lecture, described the late engineer as the heart of Railways in Sri Lanka and whose influence is alive to this day in the many improvements that he had brought during his reign as General Manager of Sri Lanka Railways, in what was fondly remembered as the golden era of Sri Lanka Railways. Immense integrity, professional competence and an almost reckless abandonment of



caution to innovate were among the attributes that defined the great man he declared. Explaining the decline of the Sri Lanka Railways after Eng. B.D Rampala handed over the reins, Prof. Kumara attributed the denial of due place to engineers in the administration and

restriction of engineers to mundane responsibilities as among reasons for it. He cited as testimony to it, the fact that Eng. B.D.Rampala had felt like a stranger on his return to the Sri Lanka Railways as a consultant and that he had decided to quit that post soon after.

## Highway Driving

by Eng Sarath Chandrasiri

Some of the points below may help not only in highway driving but also in normal driving.

**The merging maneuver:** One of the most misunderstood maneuvers that you have to execute when you first start driving in other countries is the merging maneuver. This particular maneuver has to be executed when you want to enter a highway from an entry point. Here you will find the entry lane running parallel with the highway for quite a long distance allowing enough time for executing the merge.

It is a point where those who are on the rightmost lane (in SL the leftmost) of the highway have to cooperate with those who are about to enter it. Here both categories are considered to have equal right of way. The one who enters the highway has to match speed with those on the highway lane and smoothly maneuver him/herself in to a gap between the vehicles. As the two streams of vehicles merge, it resembles a closing action of a zip.

Those who are on the highway lane have to cooperate by leaving a gap for the incoming vehicle to get in to and perhaps speed up or slow down to match speeds so that the whole manoeuvre may be executed safely. Any purposeful obstruction of the incoming vehicle as frequently happens in SL could lead to disaster in a highway.

**The Safety cocoon:** It is always useful to imagine a safety cocoon around the vehicle you drive and try to avoid any vehicles entering this cocoon. The cocoon does not spread much on the right and left but could be quite extensive in the forward and backward directions. The size of the cocoon varies with your speed as well as other road conditions and vehicle condition. In highway driving, the cocoon size would be quite large. An experienced driver instinctively decides the cocoon size depending on these factors.

If the vehicle in front intrudes in to your safety cocoon you should slow down immediately. This has two effects. Firstly, the relative speed of separation between the two vehicles will increase. Secondly, the cocoon size

*Contd. on page 9...*

## Mr. R. W. R. Pemasiri appointed Secretary, Ministry of Ports and Highways

Article forwarded by Eng. (Brig.) K D A Perera



Mr. R. W. R. Pemasiri was appointed as the Secretary, Ministry of Ports and Highways with effect from 8<sup>th</sup> December 2011. Prior to this appointment he served as the Director General of the Road Development Authority (RDA) and in addition, was serving as the Acting Chairman of the RDA.

Mr. Pemasiri is a graduate of the University of Peradeniya with a B.Sc. Hons Degree in Civil Engineering. He has also obtained M.Eng in Construction Management from the University of Moratuwa. He is a member of the Institution of Engineers,

Sri Lanka. He obtained L.L.M. from Robert Gordon University of Scotland and also a member of the Chartered Institute of Arbitrators, UK. He also obtained a diploma in Arbitration from ICLP Sri Lanka.

In 1981 Mr. Pemasiri joined the then Department of Highways, Sri Lanka as an Executive Engineer and continued to serve in the same position under the RDA until 1989. With the establishment of Provincial Councils, he was appointed as the Director of Highways in the Provincial Department of Highways in Southern Province in 1990 and later he was appointed as the General Manager of the Southern Provincial Road Development Authority and served in that position till February 2005.

In March 2005 Mr. Pemasiri was appointed as the General Manager of the RDA and later his position was upgraded as the Director General, RDA.

*Contd. on page 3...*

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## ANNUAL EVENTS CALENDAR - 2011 / 2012

Event	Dates
◆ Dr. Ray Wijeyewardene Memorial Lecture	Tuesday - December 13, 2011
◆ Eng. B D Rampala Memorial Lecture	Tuesday - December 20, 2011
◆ R H Paul Memorial Lecture	Thursday - February 09, 2012
◆ Induction and Graduation Ceremony	Friday - August 17, 2012
◆ E O E Pereira Memorial Lecture	Thursday - September 13, 2012
◆ D J Wimalasurendra Memorial Lecture	Monday - September 17, 2012
◆ Techno Exhibition	Friday - Sunday October 5-7, 2012
◆ Inauguration of the Annual Sessions	Friday - October 19, 2012
◆ Annual Sessions Seminar	Saturday - October 20, 2012
◆ Annual Field Visit	Sunday - October 21, 2012
◆ Presentation of Technical papers	Monday-Wednesday October 22, 23 & 24, 2012
◆ Presentation of Technical Papers by Young Members	Thursday - October 25, 2012
◆ Dr. A N S Kulasinghe Memorial Lecture	Thursday - October 25, 2012
◆ Techno Awards Ceremony	Wednesday - October 24, 2012
◆ Annual General Meeting	Saturday - October 27, 2012

### Note:

Associate Members who wish to apply for the Professional Review, are strongly advised to attend all Memorial Lectures and keep a record of the attendance for any future reference.

## ANNUAL SUBSCRIPTION FEES FOR THE YEAR 2012

Class of Membership	Amount in Rs. (Excluding VAT)
Fellow	5000
Member	4000
Associate Member	3000
Affiliate Member	2500
Associate	2500
Companion	2500
Student Member < 35	1000
Student Member > 35	2500

International Professional Engineer (IntPEng)  
Subscription Fees excluding VAT- Rs 2,500/=

### Discounts

- In respect of membership subscription fees, a discount of 25% will apply to members other than Student Members who are above 60 years of age and who declare that their annual income is less than Rs. 600,000/=.
- A discount of 10% on all annual subscription fees (including IntPEng) for the year 2012 will apply if paid in full on or before January 31, 2012.

*Please fill in with block letters*

Form No: DES/S/1

THE INSTITUTION ENGINEERS, SRI LANKA

## APPLICATION FOR A SEAL - 2012

Notes to applicants:

- Only Corporate Members can apply for the seal.
- The seal will carry the name and the logo of the Institution along with the surname and initials of the member as given in the records of the Institution (unless otherwise specially requested by the member), his/her membership number and the date up to which the seal would be valid.
- The validity period of the seal would be as follows depending on the years for which we receive subscription fees from you:
  - If the subscription fees for 2012, 2013 and 2014 are all paid together at once - The seal will be valid up to 31.03.2015
  - If the subscription fees for 2012 and 2013 are paid together at once - The seal will be valid up to 31.03.2014
  - If the subscription fees for 2012 is only paid - The seal will be valid only up to 31.03.2013
- We will be processing your application once you have paid Rs 1,000/= being the payment due for the seal and settled the appropriate subscription fees.
- When your seal is ready for collection we will be notifying you about it via email and in the event you do not hear from us within two months of applying, you are kindly requested to straightaway collect your seal from our reception desk during office hours.
- Please return this form to the cashier along with your dues.

THE SEAL

Full name (Eng/Prof/Dr/Mr/Ms): \_\_\_\_\_

State how you wish to have your name appear in the seal:  
\_\_\_\_\_

Discipline : \_\_\_\_\_

Postal address : \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_.

Home Phone : ( ) \_\_\_\_\_ Office Phone: ( ) \_\_\_\_\_

Mobile Phone : \_\_\_\_\_ Fax: ( ) \_\_\_\_\_

E-Mail Address : \_\_\_\_\_ Membership Number: \_\_\_\_\_

Signature: ..... Date: .....

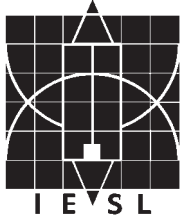
.....  
*For office use*

*Payment of Rs 1,000/= received for the seal. All subscription fees up to and including the year/s 2012/2013/2014 are settled.*

.....  
Cashier

.....  
Date

## The Institution of Engineers, Sri Lanka



# Call for Papers for the Annual Sessions 2012

### Call for Papers

The Institution is pleased to call for technical papers to be presented at the Annual Sessions to be held in October 2012, which will provide a forum for engineers to share their experiences and is aimed at general advancement of science and practice of engineering in all disciplines.

The paper should generally be of value and interest to Engineers and contribute in the advancement of the Profession of Engineering. It must be based on review of past practice, information of current interest, or probing into new fields of engineering activity. It should be a presentation of thought provoking study contributing to planning, analysis, design, construction/ fabrication/production, management or maintenance of Engineering developments. In this context, practical papers are strongly encouraged. Wherever possible, theoretical papers should include a section on practical application or additional research areas to be pursued for effective technology transfer.

### Submission of Papers

**Intention for submitting a paper should be conveyed to the IESL on or before 15<sup>th</sup> March 2012 in the stipulated form (iesl/pub/form/01)\* with a synopsis of the proposed paper (not exceeding 200 words).**

This synopsis is used by the Editorial Board for preliminary screening. Subject to the proposed synopsis being accepted in-principle, which will be finalized by 31<sup>st</sup> March 2012, full technical paper in the stipulated format (iesl/pub/guide/01)\* should be submitted on or before 30<sup>th</sup> April 2012, in the form of two hard copies and a word-processed soft copy, to be subjected to the refereeing process.

All papers will be refereed by at least two subject specialists. The decision of the Editorial Board on the acceptance of the Paper for publication shall be final.

It is mandatory for the authors of all accepted papers to present them at the Annual Sessions of the Institution, held in the month of October 2012.

### Schedule of Key Dates

**Last date for receipt of abstracts** - 15<sup>th</sup> March 2012  
**Notification of acceptance** - 31<sup>st</sup> March 2012  
**Last date of submission of full paper** - 30<sup>th</sup> April 2012  
**Proposed dates for annual sessions** - 22<sup>nd</sup> to 24<sup>th</sup> October 2012

### Best Paper Award

Best paper based on the marks given by referees and judges at the presentation, will be entitled to the prestigious Prof. E.O.E. Pereira Award.

### Mailing

**All abstracts, full papers and other correspondence should be addressed to:**  
**Eng. (Prof.) K.P.P. Pathirana**  
**Editor, Technical Papers for Annual Sessions,**  
**The Institution of Engineers, Sri Lanka,**  
**120/15, Wijerama Mawatha,**  
**Colombo 7.**

Tel: 011-2698426 Ext. 232, 207

Fax: 011-2699202

Email: dir.pub@iesl.lk, ieslpub@gmail.com.

\* Softcopies could be obtained by a request to Miss. Gayathri, through email <ieslpub@gmail.com> or <dir.pub@iesl.lk>

## NOTICE TO ALL WOMEN ENGINEERS

PLEASE NOTE THAT YOU ARE AUTOMATICALLY A MEMBER OF WOMEN ENGINEERS FORUM IF YOU ARE A MEMBER OF IESL.

### Please Participate in WEF Activities

For further details please contact joint Secretaries:  
 Eng. (Ms.) W V De S Kanakarathne 0771-093125 or  
 Eng. (Ms.) Kushmy Senaratne 0777-716026

## Why not obtain International Recognition through the Professional Engineer qualification?

### What is International Professional Engineer qualification?

International Professional Engineer (IntPE) is a qualification awarded by the Engineers' Mobility Forum (EMF), coming under the International Engineering Alliance (IEA).

EMF facilitates cross-border practice by experienced professional engineers. In general, a Professional Engineer of one EMF member jurisdiction will be able to practice in another EMF member jurisdiction without being required to obtain any additional qualifications or experience. The current EMF signatory countries are Australia, Canada, Hong Kong, India, Ireland, Japan, Malaysia, New Zealand, Singapore, South Africa, South Korea, Sri Lanka, Taiwan, United Kingdom and United States.

### Who is eligible to apply?

The IESL, being a full member of the EMF is empowered to award the IntPE (Sri Lanka) qualification to Chartered Engineers who are Sri Lankan national and who meet the following requirements:

1. A four year recognized engineering degree
2. Seven years experience after graduation with at least 2 years responsible experience in significant engineering work
3. A satisfactory level of Continuing Professional Development (CPD)

Chartered Engineers who do not possess a **four year full time degree** in engineering are presently not considered for the IntPE qualification.

### What are the benefits?

Those who become Professional Engineers through IESL will have the following benefits:

1. Use of the letters IntPE (Sri Lanka) after his/her name
2. Easier admission to National Registers of IntPE Registers of other member jurisdictions

### How to apply?

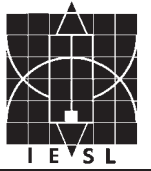
**Application forms and guidelines could be downloaded by clicking 'World Recognition' on the home page of IESL website at [www.iesl.lk](http://www.iesl.lk)**

*Contd. from page 1....* **Mr. R. W. R. Pemasiri**

From November 2009 to date he was also serving as the Acting Chairman, RDA.

During his long service in the road sector, Mr. Pemasiri has contributed at many national and international seminars and workshops and also has undergone specialized training in the subject areas such as project implementation, procurement management and road construction and management. He was also the Project Director of successfully completed two major provincial road projects, funded by the ADB and implemented under the Ministry of Provincial Councils and Local Government.

During his service as the Director General and the Acting Chairman of the RDA, he was responsible for the development, maintenance and management of the national road network totaling 12,020 km and for overall administration of the RDA. It needs to be noted that the achievements made by the RDA in the development and maintenance of national road network during his tenure are remarkable.



Sri Lanka  
Engineering News

## Mission Critical Systems

The statement that a “Flap of a butterfly’s wings in Mexico could set off a Hurricane in Texas” is often quoted in books written on the “Chaos Theory”. The flapping of the wing characterizes a tiny alteration to a system, which can trigger off a massive chain of events as time goes on. According to the Chaos Theory, a small change in one place could result in a large change elsewhere, may be with a time delay.

I reproduce below one version among many of another well-known parable on chaos titled “*For want of a nail a, kingdom was lost*”

*For want of a nail a horseshoe is lost.  
For want of a horseshoe a horse is lost.  
For want of a horse a rider is lost.  
For want of a rider a King is lost.  
For want of a King a battle is lost.  
For want of a battle a kingdom is lost.*

The Chaos Theory came in to my mind during a very interesting post lunch discussion I had with a senior Additional General Manager (AGM) of Ceylon Electricity Board (CEB), to whom I was always fond of listening, for his far reaching visionary thinking. As he will be saying adieu to his illustrious carrier at the CEB in a few weeks time, I thought of dedicating this editorial to him.

He was giving me some hints for preparing the Corporate “Balanced Score Card”, a strategy management tool, the CEB was to adopt. He drew my attention to what he called “mission critical systems” or weak links, (මර්මස්ථාන) which if lost, could knock down an entire system. He was citing certain seemingly insignificant components of the CEB’s generating system, the failure of some of which could lead to the failure of larger apparatus even leading to the failure of a larger sub system, having the potential of affecting a large extent of cultivable land of the country due to its strategic significance.

For obvious reasons, I would not mention here the details. However, my intention here is to bring to the attention of all engineers, the importance of identifying such mission critical systems within your individual purviews for the purpose of mitigating possible nation wide adverse impacts.

Eng Gamunu Abayasekara, this editorial is my tribute to you on the eve of your departure from the state service.

Lakshitha Weerasinghe, Editor  
lakshitha@iee.org



## Letters to the Editor

### SLEN Oct. – Nov. Editorial - The other side(s) of the coin

by Eng. M. K. Chandrasekera

Having read the above Editorial, I felt that the Editor had made use of his position to make comments on areas that he is not properly qualified to talk.

In the middle of his writing he has put in a paragraph about the reservoirs, water ways and the methods of irrigation. He then abruptly jumps into conclusion about an Irrigation Project called “multi billion rupee NCP Canal Project”.

As far as I am aware, the Editor is an Electrical Engineer working in the CEB. If an Engineer working in the Irrigation Department or Mahaweli Authority wrote about the sensibility of building the Norochcholai Coal Power Plant in preference to an ocean thermal Power Plant or a Dendro Power Plant, I am sure he would have got offended and questioned the qualification/competence of that Engineer to give opinions about the unknown subjects.

In good old days when the disciplines were not so divided as of now, an Engineer was supposed to be competent to give advice on any branch of Engineering. Today it is not so. Within the broad umbrellas of Civil, Mechanical or Electrical Engineering there are many sub routes of specialization.

Accordingly, being a responsible professional and being the Editor, he had better restrained himself from passing judgments on things of which he had not acquired a proper knowledge.

### Editor’s comment:

I deny the allegation made by Eng. Chandrasekera that I had made use of my position as the Editor to comment on areas in which I am not qualified to do so.

Contrary to what he has expressed, I will definitely not get offended if an engineer working either in the Irrigation Department or the Mahaweli Authority questioned the sensibility of establishing the Norochcholai Coal Power Plant in preference to an Ocean Thermal Power Plant or a Dendro Power Plant. In fact I will certainly welcome such a move as I always believe in the fact that only from outside that one can see the “other side(s) of the coin”. You do not have to be an expert on a system to notice salient features of that system provided you have a basic knowledge of the system.

While thanking Eng. Chandrasekera for coming forward to make those comments, and giving due respect for those comments, I wish to state here that the message I wanted to convey to the readers through that Editorial of mine was the need to look at a problem from different angles and using our creative skills to bring in a final product that will have long term benefits to the mankind.

SLEN will continue to be open for discussions on any such project by our members, irrespective of their disciplines, provided they adhere to the accepted norms of publication.

## Functions of Bisokotuwa

by Eng Sarath Chandrasiri

With reference to Eng Kapila Peiri’s comments on Bisokotuwas, appearing in the December 2011 of SLEN, I have to make the following comments, which I am keeping very brief at the request of the Editor.

Leaving aside minor matters such as shear forces in water (about which I was wrong), expansion and compression of water (about which I still think that I was right), there is only one major issue remaining.

If the theory is that the Bisokotuwa functions only due to frictional/viscous forces of water, then we can verify its validity by applying the methodology that I applied in the case of the Slinky Problem, namely subjecting the theory to special cases. In this case we can consider a zero viscosity super fluid such as liquid Helium instead of water.

What would happen if Parakrama Samudra is filled with liquid Helium? Would the Bisokotuwa lose its effectiveness? I think not. It would still function in reducing the rate of change of hydraulic pressure in the downstream outlet.

The analogous special case in my electrical circuit is having superconductors (zero resistance). My smoothing circuit would still be highly effective in reducing  $dV/dt$  at the load. The only difference is that there is no damping and the changes would continue, theoretically, forever. The circuit presented shows that the system is basically an energy exchange system.

Similarly, the pressure peaks in the reservoir-bisokotuwa system filled with liquid Helium would continue forever. But the rates of change will be reduced because of the capacitor. I accept that friction due to viscosity also plays a part by damping the variations so that steady state is reached rapidly.



## Puzzle - 46

### A Foolish One

#### 46-A: The Easy One

It is said that on hearing a joke, a fool would laugh three times, with a substantial time interval between the laughs. Actually, the gap between laughs is a good indication of the degree of stupidity of the individual. Why three laughs and why the gaps?

#### 46-B: The Difficult One (Contributed by Eng. Ranil Senaratne)

The factory manager of SLL finds that he has overestimated the demand for their first and only product when recruiting his workforce. As a result, their manufacturing capacity, which is C units per day, exceeds their daily demand of D. Their manufacturing operations require highly skilled workers and are labour intensive. The large labour force results in a heavy fixed cost burden and consequently the factory has been making a loss. There is great pressure on the factory manager to immediately reduce this fixed cost.

The factory manager feels that he can effect this cost reduction by reducing his workforce immediately and, when the demand does increase, by adding staff subsequently. The latter costs Rs. A per worker (cost of recruiting and training) and requires T days (independent of the number of new workers) for training. (Workers can be fired without incurring a cost.)

The sales manager's revised demand growth estimate is G units/day/day, and the management accountant has calculated the daily wage to be Rs W.

Derive an expression which gives the level to which the factory capacity should be reduced to minimize labour costs.

**Correct answer must be sent by email to [cebos@ceb.lk](mailto:cebos@ceb.lk) with copies to [puzzleguru.lk@gmail.com](mailto:puzzleguru.lk@gmail.com). Please indicate your name, membership number and date of birth along with the answer. Also indicate the puzzle number in the subject line of the email. The winner will be declared in the February 2012 issue of the SLEN along with the correct answer.**

## Solution for Puzzle No. 41

#### (THE NUT PROBLEM AND OTHERS)

Correct solutions were sent by:

A.V.S. Weerasinghe (F 772)  
M.A.C.A.D. Mataraarachchi (AM-6883) : 1978  
G.A. L. R. Perera (AM 10750): 1980  
G.A.M.I.U. Wijetunga (M-5905)  
Senajith Dasanayake (M 3294) 1962  
M.H.A.R. P. Appuhamy (A/M 10476) 1982

The winner is Eng Priyantha Appuhamy, as the youngest out of the above.

#### SOLUTION FOR PUZZLE 41

**Problem 1:** Eng Vernon Weerasinghe says: Although the problem is at the top of the truck which has got stuck, the easiest solution lies at the bottom, by letting off some air in all the wheel tyres just sufficient to lower the entire truck so that the truck would get unstuck from top and can be driven slowly out of the underpass. Well this same problem is supposed to have taken place long time back at the Ramboda Pass on the Gampola – Nuwara Eliya road, where the vehicles have to go through a very narrow stretch of road with a natural rock cliff overhanging above the road. At this point no two vehicles can cross. Similarly a lorry has got stuck in the overhanging rock cliff. While the men were thinking of ways of tackling the problem with the top of the lorry stuck, a small boy is supposed to have given the easiest solution by letting off some air from the tyres.

**PG's Comment:** We understand that some engineers were among these men. One had his lap top out and was using FEM software to work out the force necessary to pull the truck out (Ha! Ha!) - Another example of how simple solutions elude the educated and trained mind.

**Problem 2 (THE NUT PROBLEM):** There are many versions to the solution. Methodology-wise they are identical. The difference is in the Story and obviously, the story makes all the difference. This is an interesting version sent by Eng Ranil Senaratne. But I have taken the liberty to change and add some of the wording and they are in italics.

A Psychiatrist (*Nut doctor*) used to visit a Mental Hospital (*Nut House*) to treat the physical ailments of the mental patients (*Nuts*). One fine day he found, on returning to his car after finishing his work, that he had a tyre puncture in one of the wheels that happened to be next to a grill covering an opening to an underground drain several meters deep. After he removed the wheel Nuts and kept them on the ground, his foot accidentally slipped against them and all four nuts disappeared through the grill into the deep drain. Now our physician – perhaps not smartest of men and certainly ill-advised to attempt SLEN puzzles! - was literally scratching his head! Apparently, all this was being quietly observed by one of the inmates (obviously not the schizophrenic type! and *obviously a Nut*) who walked up to the doctor and suggested that he should remove one nut each from the other wheels and fix the spare. The doctor at once proceeded to follow the inmate's advice and before departing profusely thanked him. The latter regarded the doctor with a quizzical smile and said, 'Doctor, I may be a *Nut*, but I am not a stupid.!' "

*Isn't it funny how many NUTS there are in the story? The whole thing happens in a Nut House, the victim being a Nut Doctor. The solution was offered by a resident Nut Case and involved, of all things, NUTS.*

**Problem 3 (Short ladders):** The following diagram explains everything. I leave it to you to check whether Eng Priyantha Appuhamy is right.

*Contd. on page 6....*

## THE INSTITUTION OF ENGINEERS, SRI LANKA



Competition



on

**“Water Resources Development and Future Challenges”- Role of Engineering meeting Future Challenges of Water Resources Development in Sri Lanka”  
Session 2011 / 2012**

**Sponsored by  
International Water Management Institute (IWMI)**

We are pleased to announce that arrangements are being made for the forthcoming Competition on Water Resources Development sponsored by IWMI towards the Annual Sessions of IESL in October 2012. The prizes will be given for the two best Technical Papers under the above mentioned theme prepared for this competition by Associate Members & Corporate Members of IESL. Jointly authored papers will be accepted, provided at least one of the authors satisfies the above criteria. Papers must be original and demonstrate the author's knowledge and experience of the subject. The award winning articles will be published in the journal, "Engineer" of the IESL.

Water is a vital input in industrial, energy, tourism, recreational, navigation, agriculture, forestry, livestock and fishery sectors. As water scarcity grows, competition among sectors and users, and between the human needs and the environment intensifies. Effective and efficient water management is therefore a prerequisite for sustainable socio-economic development.

The paper can address extraction, storage, distribution, use and disposal issues in any economic sector. It should illustrate how engineering and technology is applied in increasing productivity, in balancing supply and demand of water and/or in reducing water pollution and protecting freshwater ecosystems.

Preference will be given to papers of an empirical and analytical nature based on primary and/or secondary data although papers addressing topical issues through conceptual development may also be forwarded.

### AWARDS & PRIZES

**(A) Rs. 45,000.00-** For members of IESL over 35 years of age on 01 October 2012

**(B) Rs. 30,000.00-** Engineering graduates holding membership of IESL and 35 years of age and below on 01 October 2012

Intention to participate in this competition should be intimated to us along with your bio-data & the full Technical Papers on or before 30 May 2012. IESL form IWMI/1 should be used for this purpose.

**Further information could be obtained from the Chairman, Steering Committee on Water Resources Development of The Institution of Engineers, Sri Lanka, on Tel: 072- 3421493 or Publicity Officer-IESL 011-2685490, 011-2698426 or 011-2699210, ext-232, 207, E-mail: [dir.pub@iesl.lk](mailto:dir.pub@iesl.lk), [ieslpub@gmail.com](mailto:ieslpub@gmail.com), Fax : 011-2699202**

## Electrification of the rail system from Panadura to Veyangoda.

by Eng. Suranjith Peiris

I hope my thoughts on this matter will help the IESL of which I was the first to qualify as a Chartered Mechanical Engineer in 1971 by being successful at its own exam.

Having served my mother land for 26 years I have been in USA for the past 24 years. This gives me a different perspective of railways. USA had 1000's of miles of rail lines in the last century. Today most of it has been dismantled. The once in a way jogging I do is along an abandoned rail track which has been converted to a walking, jogging and cycling trail, well lit even at night. The jogging track is covered with a soft layer to prevent injury to the knee joints etc. The last leg of the rail system, the passenger traffic that is struggling to operate is running at a loss, heavily subsidized by the Federal Government. The motor car and air transport has taken over passenger transport. One of the few uses of the rail system today is to transport new cars from the manufacturer to the retailers. This too is being surpassed by specially designed trucks that can carry about 25 cars and avoids double handling from rail station to the retailer, by going directly from the manufacturer to the retailer may be 2,000 miles away. Most of these have arisen as USA is 100 times larger than Sri Lanka in area and has only 12 times its population. Density of population is a key issue in passenger transport. When I was putting up Ruhunu Cement Works in Galle in the 1960's, I met several individuals who travelled daily to Colombo for work. Electrification would not help such passengers. Regular train users are not concentrated within a 20 mile radius.

In Europe and Japan the situation is different as they are smaller in area and denser in population distribution than USA. Because of this passenger traffic is heavy from home to workplace. I have experienced passenger transport in both these countries. During my recent visit to Italy, I did see a large number of heavy trucks, even all the way from Russia. In the past this would have been by rail. Perhaps commercial rail transport is declining in Europe too.

If only 7% of passengers are carried by Sri Lanka Railways, how is it economically feasible to dump so much capital to electrify the rail system from Panadura to Veyangoda? Having been trained at the CGR workshops in Ratmalana, to me it is quite clear that maintenance cost of electric engines is lower than that of diesel engines. Is the cost difference so great so as to justify electrification? What will happen when a drought sets in and the hydroelectric power, on which Sri Lanka depends so much, is not available? Does the rail system come to a standstill?

To me the proposal to electrify the rail system from Panadura to Veyangoda looks disastrous.



**THE INSTITUTION OF ENGINEERS,  
SRI LANKA**  
Competition  
on



**"Eco Efficient Water Infrastructure for Sustainable Development – Experiences gained from Integrated Water Resources Infrastructure Development in Sri Lanka"**  
**Session 2011/2012**

Sponsored by  
**St. Anthony's Industries Group (Private) Ltd.**  
(MANUFACTURES OF ANTON PVC PIPES AND FITTINGS)

Two competitions will be held this year for the award of certificates and cash prizes. The competition soliciting original Technical Papers on research and case studies are accepted from members of IESL who are above 35 years.

There will also be another competition for members who are 35 years and below on **01 October 2012**. This competition is open to members of IESL and final year students of Faculties of Engineering of Universities in Sri Lanka who are student members of IESL or who obtain such membership before submitting their technical papers.

### AWARDS & PRIZES

ABOVE 35 YEARS ON 2012.10.01	35 YEARS AND BELOW ON 2012.10.01
<b>First Prize</b> - Rs. 50,000/=	<b>First Prize</b> - Rs. 25,000/=
<b>Second Prize</b> - Rs. 25,000/=	<b>Second Prize</b> - Rs. 15,000/=
<b>Third Prize</b> - Rs. 10,000/=	<b>Third Prize</b> - Rs. 5,000/=

The members (Fellows, Members, Associate Members, Associates, Companions and Students) who wish to participate must obtain the application forms from IESL and **submit bio data & full Technical Papers** to reach the Executive Secretary, Institution of Engineers Sri Lanka, No. 120/15, Wijerama Mawatha, Colombo 07 **on or before 30 May 2012.**

Further information could be obtained from the Chairman, Steering Committee on Water Resources Development of The Institution of Engineers, Sri Lanka, on Tel: 072- 3421493 or Publicity Officer-IESL 011-2685490, 011-2698426 or 011-2699210, ext- 232, 207, E-mail: [dir.pub@iesl.lk](mailto:dir.pub@iesl.lk), [ieslpub@gmail.com](mailto:ieslpub@gmail.com), Fax : 011-2699202

## Health Insurance Scheme for the IESL Members

Dear Member, Hurry Up! Time is running out!

Submit your proposal forms to the IESL soon.....or else you will be run out!

This special offer for this year will end soon.

The burden of the Hospital Bill can be very heavy....but if you are wise enough you can transfer the burden to a third party. Don't miss this chance!

**For details contact the IESL Finance Division**

In terms of good health the engineering professionals usually carry a high risk due to the sheer nature of their profession. Unlike other professionals they usually engage in field works, hazardous works, and are open to environmental forces. As such imagine a situation which requires you to be hospitalized. Then who will foot the bill.

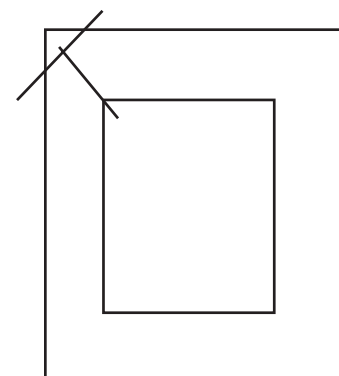
Don't worry. Now the IESL has come forward to give a remedy for you. The IESL in collaboration with the NITF (a corporate body coming under the Ministry of Finance) has arranged a Health Insurance Scheme for your benefit. Now you can get your risk covered by paying just one tenth or so of the amount covered.

### Main Features of the Scheme:

- This is a group policy and has commenced on 01-12-2011. Even if you join now you will get all the benefits. The only loss is that you forgo that no. of days up front. Join before the offer end soon.
- Members upto 85 years are eligible
- Join in without undergoing any medical test
- Sum insured ranges from Rs. 150,000/= upto Rs. 1,000,000 (6 options are available) which covers hospital expenses
- Additional Rs. 500,000/= cover for 25 critical illnesses for no increase in premium
- Personal accidents, eye care, child births, deaths etc., also covered for no additional premium
- Treatment taken in Private and Govt. hospitals as well as Aurvedic hospitals are accepted
- Spouse and the children also covered but no added premium
- Members working abroad can insure the spouse and children or parents if they are living in Sri Lanka.
- Hassle free hospitalization and bill settlement system

Contd. from page 5....

Solution for Puzzle...



## B.Sc. degree in Transport & Logistics Management at University of Moratuwa gets CILT Accreditation

Sent by Prof. Amal Kumarage



In the photograph (Left to Right)

- Prof Malik Ranasinghe – Former Vice-Chancellor, University of Moratuwa
- Prof Amal Kumarage – Chairman CILT Sri Lanka
- Mr Saliya Senanayake – International Vice President CILT

The Faculty of Engineering at the University of Moratuwa has produced yet another world class degree program. The B.Sc. Honours Degree in Transport & Logistics Management has been accredited by the Chartered Institute of Logistics and Transport (CILT) as fulfilling all the academic requirements for the Charter Membership of the Institute. The Institute founded in 1919, and which received its Royal Charter in 1926 has recognized only a handful of degrees as being fully fulfilling all the academic requirements. A program to mark this occasion was held at the Continental Hotel, Colombo on 9<sup>th</sup> August with Prof Malik Ranasinghe as the Chief Guest. The event was also attended by the Chairman of the CILT Sri Lanka, Professor Amal S. Kumarage, Dean Faculty of Engineering, Prof Anuruddha Puswewela and Mr Saliya Senanayake, International Vice-President of CILT.

The Chartered Institute of Logistics and Transport (CILT) is a uniquely established global professional body associated with logistics and transport with over 33,000 members in over 30 countries worldwide. The Chartered Institute of Logistics & Transport in Sri Lanka was established in 1985 by an Act of Parliament.

The B.Sc. degree program in Transport & Logistics Management at the University of Moratuwa began in 2006 at the request of the industry. It has had an annual intake of 50 students from the Mathematics stream of the GCE Advanced Level examinations. Entry to this program is highly

competitive and is currently one of the top four courses in the Mathematics Stream for most districts. The study program is offered under the Faculty of Engineering and through a separate department of Transport & Logistics Management. It is a four year course conducted in the English Medium. As a modern curriculum it contains many learning oriented components including leadership training, mentoring, community development, full time internship with industry, presentation and communication skills development etc. The subjects range from technical content in aviation, shipping, transport, supply chain, roads and railways areas to the full range of management subjects. It has 150 credits and can be considered as a double degree in Management and Transport. It also has a heavy component of mathematics subjects underlying the analytical orientation of the course. Its first batch of students that graduated in October 2010 are now fully employed in the airlines, ports, shipping companies, supply chain companies, freight forwarding companies, highways agencies, manufacturing companies etc both locally and abroad.

The study program has been closely associated with the local industry right from the beginning even in curriculum development. Senior executives function as official mentors of students and all students complete a six month full time internship in the industry. Many industry leaders serve as visiting faculty and guest lecturers. These aspects have made students who graduate ready for the challenges of the world of work.

## OPINION

### WHAT CAUSES MANY SRI LANKANS TO BE DEFICIENT IN PATRIOTISM AND DUTIFULNESS

Prepared by: Eng. S D Jayaweera

It is really disturbing to note that currently the average Sri Lankan ails from lack of patriotism and dutifulness, compared to citizens of other South Asian Nations. These weaknesses of ours have always been puzzling and hurting us to a great extent. It is clear that this change in trend has been creeping into our society since the beginning of 80s. The purpose of this article is to draw your attention to this matter with a view to stimulating a meaningful dialogue between us in this context. It is also high time for us to think positively and contribute in a manner that will address this situation individually as well as a community within our controls as an initial measure.

Prevalence of selfishness over all other factors has become order of the day. People tend to ignore common ethics and national interests when they want to get their things done in their day to day life. I believe these attitudes also have greatly influenced and misguided their kith and kin to a great extent. As a matter of fact, it is a common trend now for the younger generation to go after personal gains as they start their working life. In contrast, in the older days those starting work used to be very enthusiastic in delivering something they have in their store to their employers and the country as a whole. They, not concerned about how much they were paid in the early days of their careers were well aware that they should earn their status by only contributing to their employers gradually and steadily. It certainly helped both the employers as well as employees to develop and maintain a good relationship in the past. The new phenomenon which has evolved as result of greediness and discontentment among the new generation has led to a certain level of insecurity and mistrust among each other. This situation, I believe, has been the reason for the employees to provoke themselves to undermine the interests and stability of the employer. The unruliness and unrest prevailing in working places today are the results of these attitudes and behavior patterns of the employees, the end result

being a negative impact on the economy of the country as a whole.

Sri Lanka is one of the countries where education and health are provided almost free. Even higher education and special medical facilities could be obtained relatively at very subsidized rates which people in other countries in our region do not enjoy. The family health care is provided by the state at no direct cost to the individual. It could be assessed as comparable as that provided in more affluent countries for which they have to pay heavy taxes and fees. The transport facilities provided to the people through the public transport network which is jointly run by the government and the private sector are extremely praiseworthy in comparison to other countries excepting India in our region. Regardless of a few weaknesses and breakdowns in the system, we should be very fortunate to enjoy these facilities at such reasonable costs. The State spends a major share of recurrent expenditure in subsidizing education, health, food, transport and national security.

We are a multi-lingual and multi-religious society which has embraced human values to its highest levels regardless of what the so called developed countries are most critical about. We have a very civilized history dating back to more than 2500 years. We have been electing our own institutions and governments since 1931. The country has been promoting gender equality with the acquisition of universal franchise for women as far back as 1933. The Buddhist Teachings and Practices have been in existence in the country for over a period of 2500 years. It is commonly believed that Lord Buddha has visited this island on three occasions. In spite of all these good policies, traditions and human qualities, we possess, it is very pathetic to observe the degrading signs of attitudes and human behavior of our people in the recent decades.

As many of you are aware and have quite distinctly observed, violation of road discipline by both motorists and pedestrians has become an alarming and dangerous trend today. It has become the No.1 killer surpassing deaths due to other causes. The reason for this behavioral pattern is again attributed to selfishness and

lack of dutifulness. They are only concerned about their immediate needs at the time they use the roads. They don't seem to consider the rights of other road users with the same prominence as theirs. Therefore respect to others as a whole is becoming a rare commodity in our society today.

Many of you would be very critical and free to cite and complain about the indiscipline and the unjustness which befall on them. Everyone would be unified in criticizing the interference of politicians in trying to help their supporters to get unjustifiable advantages and benefits over other more qualified persons concerning various public issues. But yet one will go to the extent of contravening common law and rules when one is after a job for one of their siblings or fighting to get a good school for their kid or trying to get a scholarship or any similar issues to their advantage. It is well known that the police in Sri Lanka are corrupt and the public demands that this practice should be rectified immediately but how many of us are prepared to undergo the pain and make an attempt to force on the police to be more lawful in carrying out their duties. So where do we stand then? One is not concerned about whether they themselves violate the proper procedures so long as they fulfill their task, but the moment somebody else violates the rules they would be very quick to pinpoint. This is exactly where we all default in public. It is a common argument that we all hear everyday, that if anything is good for the politician, our boss, our next door man or somebody else, what is wrong in our doing the same thing. This practice could be simply defined as aiding the wrong-doers. These are not Buddhist Ethics by any means. Can we be satisfied as Buddhists by just visiting our temples on Poya Days and partaking in religious activities only? Leave aside the more complex theories taught in Buddhism for the time-being, as practicing

*Contd. on page 11...*

## Looking for an engineering job in a foreign country?

by Eng. P.H.V.S. Kulatilake.

It is not an exaggeration to assume that over 50% of our engineers that graduated from universities and accredited institutions in Sri Lanka have worked or are currently working in foreign countries as professional engineers. For instance, 16 out of 23 electrical engineers who graduated in 1986/1987 from University of Moratuwa, are working in foreign countries today. At present the number of engineers ready to enter the workforce in a year from Sri Lankan institutes is close upon 1000. I am certain that more than half of this number would like to work in a foreign country owing to various reasons; such as lack of opportunities in Sri Lanka and to improve their financial stability or to gain more experience in the field.

The engineering degree awarded by Sri Lankan universities is definitely on par with a similar degree awarded by any other university in the world. Engineers graduated from Sri Lankan universities who are working in overseas assignments are doing extremely well, which is a reason to be proud of. The theoretical knowledge gain from Sri Lankan universities is held in high esteem all over the world.

Acquiring a suitable job overseas or working in foreign engineering firms is somewhat different to the acquisition of an engineering job in Sri Lanka. Hence, it is important to identify the factors and weigh them before venturing to search for a suitable job overseas in the engineering field. This article might be of immense help to assess yourself in finding a suitable job or to improve the required skills you may need to succeed in your position as an engineer once you go to a foreign country for the first time. This article is based

on a sample study conducted by the author on case studies of several engineers working overseas coupled with personal experience. The sample consists of more engineers who have migrated to Canada, to Australia and to the USA than, engineers working on termed contracts in other foreign countries.

### General factors

#### 1. Age

Age is one of the important factors that has to be taken into consideration if you decide to work in a foreign country. To migrate to a country like Canada, Australia or USA, it is extremely important to make such a decision in the early days of your career. It will be very difficult to find jobs and to work successfully in the job for the first time in a foreign country, if you are more than 45 years of age. However if it is for a term contract in a foreign country, this age limit might not be of significance. The best age limit for migration would be between 30 to 40 years. By this age, one would have gained sufficient experience to try a foreign job. More over the fact that one has served our mother land for a considerable period of time, should help to make him/her feel at ease.

#### 2. Family Status

This is another important factor to consider. Unlike in Sri Lanka, the cost of daycare centres for children is expensive in countries like Canada, Australia and USA. For families with very young children, it is better to think twice before making any move. At the least, children should be in schooling age so that they will be in school during your working time. A colleague of mine migrated to Canada with his family consisting of two very young children. He could not find a suitable job in the field of his choice and during the first six months he worked on odd jobs which did not bring him

sufficient wages to pay for a day care centre for the two children. After vacillating in various jobs for six months in Canada, unable to gain stability, he eventually returned to Sri Lanka.

#### 3. Economic stability of the country.

Professionals are definitely not desirous of securing jobs in countries where there is an ongoing war or that are in dire economic straits. The country you wish to work in, should have a strong economic background or should have development programmes funded by recognized establishments like UN, ADB or World Bank. I recall how two of my colleagues undertook some assignments in Iraq a few years ago but had to return to Sri Lanka after working for a very short period when the war began in Iraq. Presently, there are numerous viable development projects that are actively progressing in countries of the African continent. However, you should make sure that the company you intend to work for, has stability and would remunerate you as agreed in the initial contract.

#### 4. Working conditions

Working conditions may differ from country to country or from project to project. Before taking over any job, you should evaluate the working conditions and working hours of the job you wish to undertake. If it is for a project, the company may pay you for all the extra hours you work, which you would like to accept. However some companies pay salaries to professionals, but there will not be payments for working extra hours. It may often be difficult to complete some tasks in a specific project within the given working hours but there will be no compensation for the extra

*Contd. on page 10...*

## Peradeniya Computer Engineering Rocks and Reigns in Motorola Enterprise Mobility 2011 Competition and a Spate of Other Events

A series of wins by Peradeniya Computer Engineering undergraduates at the highest level of Industry competitions has taken the Sri Lankan Computing establishment by storm.

They beat teams from all other established Computer Engineering/ Science faculties/departments of Sri Lankan university system and the multitude of private sector establishments to represent Sri Lanka at prestigious Microsoft Imagine Cup 2011 finals held in New York.

They were also the winners of Inter University Enterprise Mobility Software Development Competition, organized jointly by the Sri Lanka Association of Software and Services Center of Excellence for Mobile and Telecom (SLASSCOM) and Motorola Technologies Lanka (Pvt.) in early October, 2011. The competition was held at the University of Colombo, School of Computing. In the immediate aftermath of this victory, Hayleys PLC, one of the biggest blue-chip companies in the country, has asked the winning team of the competition to do a pilot project around the solution they proposed in the competition as an application for their agricultural machinery sub-sector.

A student from the department won a cash award and certificate, while another was awarded a certificate at "Migara Ratnatunga Trust Awards competition for The Best Undergraduate Industrial Training project", organized by the IESL.

Another Computer Engineering undergraduate became one of the finalists in Mbillionth South-Asia Award – 2011 competition under the category m-Education and Learning; he was the only undergraduate finalist representing Sri Lanka at the competition held in India.

These recent achievements of Department of Computer Engineering in its sector of Sri Lankan industry provide ample evidence of the commanding position reached by the department and the university in all what concerns Computer Engineering in the country.

It is noteworthy that all engineering faculties of Sri Lankan university system and public and other private-sector higher educational establishments engaged in awarding computer related undergraduate programmes in the country were represented in these competitions and the victories were obtained through hard competition: for instance, in the Enterprise Mobility Software Development Competition mentioned above, among the 16 teams who came to the final round, 4 teams were from the Department of Computer Engineering, Peradeniya and one other team was from Department of Electrical & Electronic Engineering, Peradeniya. The panel of judges included both local and foreign high-profile professionals in the domain. In the previous year too, the department of Computer Engineering showcased two very cutting edge solutions and one was adjudged the first runner up at the same competition.

These victories are in a backdrop of a set of victories by several departments of Peradeniya Engineering in general: the departments of Computer, Civil and Electrical & Electronic Engineering won the best awards at Young Inventors, Best Industrial Training Project and Best Electrical Engineering Project competitions, all organized by IESL in the year 2011. A group of Electrical & Electronic Engineering students represented Sri Lanka at "ABU Robocon 2011" in Thailand. Four Final year Electrical and Electronic Engineering students were selected for the final round of the 'International Future Energy Challenge' (IFEC). Department of Computer Engineering is emerging as a major force in guiding the local software Industry and also asserting itself as an internationally recognized research institution in the domain. The departments' many core and interdisciplinary research groups conduct research on topics such as Computer Architecture, Embedded Systems, Complex Reactive Systems and Intelligent Systems and regularly publish at various local and international conferences.

**-Acting Head,  
Dept. of Computer Engineering, University of Peradeniya**



*“The following article was written by Eng A.M. Amila Shivanthaka Dayarathna, attached to the National Water Supply and Drainage Board, a Postgraduate student following an MSc course in Environmental Engineering at University of Moratuwa as an assignment given at the start of the program and was forwarded to SLEN by Eng. Prof Mrs. Niranjani Ratnayake, Senior Professor, Department of Civil Engineering, University of Moratuwa”*

## My Efforts to Implement Sustainable Development Principles at Site

As humans, we consume resources in various forms to perform our day to day activities and to preserve our comfort. From the alarm we wake up in the morning to the light we turn off to sleep, it is resources that we consume. It is not just you and me, but the massive seven billion of people all around the world use their portion of resources, daily. However, the earth being an isolated globe in the universe, has a very limited amount of resources available to be consumed. There we have the importance of consuming these resources to meet our needs while preserving them for the future generations, which is called “Sustainable Development” in short. While we must all do our part to minimize our ecological foot print by taking measures for resource conservation in our activities as individuals, we engineers have a bigger role to play, as our profession inherently makes use of large amounts of resources, as given in the definition of Engineering - *“the Art and the Science of working with the great sources of power in nature for the use and benefit of Society”*

Being a Civil Engineer employed as a construction consultant of a 1500m<sup>3</sup> capacity, 32m high water tower, I have the responsibility to carry out all my activities ensuring Sustainable Development.

As a construction consultant, a major responsibility assigned to myself is carrying out site inspections especially prior to concreting. An Elevated reservoir being a water retaining structure, carries a high risk of deterioration due to corrosion of steel reinforcement. If corrosion takes place within the structure, lifespan of the structure will shorten dramatically. Shorter lifespan will lead to frequent repairs or reconstructions consuming a lot of materials and labour. So, verifying a long lasting construction during my inspections will ensure saving of resources in the future. Considering this fact, I pay my fullest attention to crucial facts like maintaining clear cover to

ensure durable construction. I have noticed and corrected small binding wires extruding towards the surface of the concrete from the main reinforcement. These small extrusions will be corroded and will be carrying moisture to main reinforcement if ignored. So, as a construction consultant, I pay my attention even on a small binding wire to ensure the durability of the structure to make sure I play my role in Sustainable Development. A common way of energy and materials being wasted on construction sites is double work. If a concrete is not vibrated properly while pouring, it might result in honeycombs which needs to be attended later. The same thing can be resulted in cases of cement grout being leaked through formwork joints. Even a small thing like placement and arrangement of falsework will consume a lot of time and energy if it has to be re-arranged at the next level concrete. So, I assist the contractor providing suggestions and instructions to avoid such double works to save time, energy and materials.

Another way that the resources being wasted on construction sites is lack of planning on activities. In this particular water tower, it includes a lot of complex reinforcements to be performed. And in some places, it is necessary to consult the structural engineer and seek for alternative reinforcement arrangements to ensure the flow of concrete through reinforcement. I even do 3D drawings of reinforcement to ensure the detailing is correct, before approving the bar schedules for bar bending. If it was not corrected there, the bended bars will have to be cut and new bars will have to be placed in case of any change to the reinforcement after binding the bars. The same way, concrete pouring schedules are checked prior to concreting, considering road traffic, batching times, pouring times...etc, to avoid any delays or wastages of concrete. This way, I can ensure the site

activities are being carried out with proper planning which in turn lead to sustainable development.

Effective outcome of the labourers is a critical achievement in terms of activity durations and the quality of work. This is achieved by preparing them a safe and hygiene working environment by frequent Safety Audits. A full inspection of the site is carried out during a Safety Audit including toilets, garbage pits, hidden corners of buildings and roof tops. Attention is paid on possible mosquito breeding sites, non hygienic environments in wash rooms, changing rooms and toilets during the audit. Also the safety concerns are addressed during the audit. All the labourers shall wear safety boots, gloves, safety harnesses (where necessary), helmets for their own safety. All paths where people travel in the site shall be clear and well defined. Labourers working at high elevations shall be provided with proper working platforms...etc. All these will lead to an effective outcome from the labourers and it will contribute to sustainable development by minimizing construction times and wastages.

While construction is to be blamed as the major reason for deforestation, we have managed to maintain an environmentally friendly site as much as we can. We have retained the trees which were originally there at the site as much as we can and have cut only that is must. We have planted new trees celebrating world environment day which keeps the worksite and the environment in harmony. Apart from all of the above concerns, I can still practice sustainable development in the office environment by printing what is must, adjusting the A/C temperature at 25-26C<sup>o</sup> range, turning off unnecessary lights, turning off computers if not used...etc. From all of the above, it feels like I am contributing towards Sustainable Development to a certain extent. If all seven billion of us can think and act towards using our resources effectively, and saving them for the next generation, this world will be full of beautiful faces, even tomorrow.

*Contd. from page 1...*

### Highway .....

decreases as you slow down. Both have the effect of the intruder exiting the cocoon.

**Rear end management:** A rear end intruder in to the cocoon is more difficult to handle. One thing you can do is to speed up to leave the intruder behind or to slow down so that the cocoon shrinks having the same effect. This gives a chance to the intruder to slow down unless he is on a suicide mission.

In Bahrain, where I live, such suicide missions are quite common and both methods mentioned above may not be practicable when you find a Dodge Charger or a Chevrolet Camaro suddenly appearing behind your car as if materializing out of thin air. The guy will not stop at the miraculous act of making a sudden appearance but will also maneuver in to kissing distance from your rear bumper. You have to remember that all this drama is taking place at a speed of above 100 km/hr. Whatever other short comings these bumper kissing Formula 1 drivers have, sounding the horn in irritation as in SL is not one of them. No Sir, they are very polite that way.

Shrinking the cocoon is not a solution in this case because the guy is just a few millimeters behind you anyway and if your cocoon shrinks any more its boundary will enter your vehicle, which of course is no man's land for cocoon boundaries.

How about the other option of speeding up? Did you say speeding up? Speeding up with a supercharged 3000 cc monster firing 8 cylinders against your measly 1200 cc 4 cylinders? You have to be crazy to try that option. Even if you succeed, the guy behind will take it as a challenge and start a racing competition with you, which is not going to be very pleasant, I can assure you, though it may be thrilling to the other spectators. Thus, changing to the other lane is the only option left unless it is already occupied by a driver on another suicide mission.

**Changing Lanes:** Bahrain is full of skilful drivers some of who are experts at lane hopping. While the rest of the traffic moves at a legal limit of 100 km/hr these lane hoppers weave left and right and fly through seemingly impossible gaps at something like 150 km/hr resembling swallows feeding on a swarm of flies.

Lane changing without proper preparation and letting your intention known to other drivers around you is extremely dangerous. You have to use your rear view mirror and the side mirrors to ensure that it is safe. You have to be mindful about the blind zone in the side mirrors. The side mirrors do not show any vehicles in this zone. This can be overcome by attaching two small higher curvature convex mirrors on the side mirrors or a quick glance over your shoulder.

The turn indicator lamps must be turned on before you execute

the maneuver. In countries like the US it is a serious offence if you change lanes without switching on the turn indicators even if the other lane is empty. The lane weavers in Bahrain do not need the side mirrors or the lights and any way do not use them because the rear view flashes by - in fact the whole future flashes by at high speed for them - in something like Einstein's time dilation effect. But lesser mortals like us cannot depend on Einstein for these things.

Once upon a time in Bahrain, an electrical engineering undergraduate did a research on the life of various kinds of lamps and found that turn indicator lamps are the longest lasting. The reason was found to be that they are hardly ever used. In fact they are used only when one learns driving after which they serve only some sort of decorative purpose. Any driver who uses turn indicators is considered as a novice and other drivers give him or her looks of disdain or pity as they pass him/her. It is almost like having a big L board on your car.

But there is a time when even the experienced drivers turn them on. That is during foggy conditions. At these times, they become over enthusiastic and as if in an effort to catch up, turn on all four of them. In other words they use hazard warning lights. However much authorities tell them that hazard warning lights should be tuned on only when the vehicle is broken down and stationary, they would not listen.

But one has to admit that it adds one more thrill to lesser mortals like us, where we have to guess which way the heavily laden container truck in front of you in the other lane is going to turn. Wait a second now - is he trying to get in to my lane or is he going straight? Should I accelerate and overtake him and risk being side swiped? Or should I slow down and allow him to change lanes risking the impatient guy behind me ramming in to my boot? These are the momentary decisions you have to take unless you follow my method given below.

**Alternative Turn Indicator:** I have developed a system to detect the intention of the other driver in such cases. In fact like an astrologer predicting a tsunami it gives a very good idea about what is about to happen.

Just watch the front wheel of the suspected vehicle. It is the first part to give signs of turning and it happens several split seconds before the general body of the vehicle starts to veer. And in driving those split seconds mean everything. This system is most useful for big vehicles. For small vehicles like cars it may not be that discriminative. But being side swiped by a car is so much softer than getting the same treatment from a heavy truck that you may even consider it as pleasant and enjoy the experience.

To be Continued.....

*Contd. from page 8...*

### Looking ...

quality time you offer. Some companies provide accommodation and transportation to work. It is important to negotiate on the provision of these facilities prior to undertaking jobs especially in the case of UN assignments. Therefore at the very outset, it is paramount to understand the terms and conditions that accompany the job offer.

### 5. Benefits

It is also important to evaluate the benefits included within the package you get. This is an essential item when taking over termed contracts. Sometimes the take home salary is same from company to company; in such instances, it is the benefit package that would help you to make the selection. Medical facilities, short and long term disability insurance and retirement plans are included in this category.

### Factors that directly affect your career

#### 1. Communication skills

Except China and Japan, English is by far the most commonly used language in almost all the countries where engineering jobs are in demand. However English will be the only language to communicate with locals in those countries too. Hence proficiency in English is extremely essential for success in your career. However, proficiency in English speaking alone does not mean that you have the requisite communication skills. As an engineer you should have demonstrated presentation skills with at least ten presentations on a known subject for large audiences. The terminology in the identical engineering field may differ from country to country. It will take at least six months to familiarise yourself with the terminology used in a particular country. Fluency in English will have a strong impact and an advantage on your career success as it will help you to adjust your communication skills with ease.

Skills in Report writing are essential for foreign engineering jobs. Although verbal communication is important for day to day activities, written communication skills set the criterion for defending your decisions. Every job, whether it is a regular maintenance job or an operation kind of a job, you would need to present a written scope, a budget and a schedule. In Sri Lanka, our engineers are vested with authority, hence comparatively easy to make or change any decisions as work progresses and will not face too many objections or obstructions. But if you are

working as an engineer in a foreign country, there will be continuous challenges even for a small change you make in the schedule, scope or the budget. The best way to defend your decision is to keep records of all written documents for future reference. Engineering being an abstract discipline, writing skills of most engineers tend to be rather weak. Hence developing skills in writing will certainly benefit your work, wherever you are.

#### 2. Marketing skills

Along with communication skills our engineers should develop their marketing skills in order to be successful in overseas jobs. Unlike in Sri Lanka, you may end up changing your workplace several times during your career due to financial instability of the organizations concerned. No company would retain you as an engineer if the company is not making any profit or is not a service which has state approval. Hence you should develop your marketing skills by quantifying the past experiences to find your next job.

About three years ago, two area engineers who had similar years of experience in area engineering in a popular utility in Sri Lanka, applied for a job as a reliability improvement engineer in a small utility dealing with electrical power distribution. As you are aware, area engineers are, perhaps the most work-loaded engineers in the Sri Lankan engineering sector. However, in the selection interview the first engineer produced a very brief version of the area engineer's manual he used in Sri Lanka and said he is in charge of all the electrical distribution activities in the area ranging from break down analysis, revenue collection, outage planning and providing new connections. He produced all the paper certificates he obtained including the degree, charter and his post graduate degrees. The second engineer who had the same experience as the former one, presented a project he executed to improve the electricity system in the area. He was equipped with the test and census sheets that he had developed to obtain the substation and distribution line status, along with maintenance plans he had developed and executed along with corrective actions in each and every substation and lines. He presented computer data sheets he used to carry out the job indicating the materials, vehicles and human resource requirements. Although the first engineer had the identical years of experience in the subject and proficiency in all activities that he performed, he did not get the job due to lack of marketing skills. The second engineer was not only selected for the position but is still working in the same position contributing his experience towards the new job in that company. The above incident clearly explains that a company offering a job to a prospective candidate places greater emphasis on what you could contribute towards the tangible benefits of the establishment, rather than on the know-how you possess.

#### 3. Technical Skills and experience

This might be the most important factor after all. Technical skills and technical experience are two different factors. You may not have technical skills but conversely possess considerable experience with number of years of service. However, the important factor is that you possess technical skills. You should have a special skill you could market yourself. You may be a qualified electrical engineer but the position available may be for a particular discipline such as designing, scope writing, protection relay settings etc. Yet, you will not get the opportunity to face an interview if you do not have requested skills in those particular areas. For example, if you are an electrical engineer specialising in substation or transmission designing, HV equipment specification writing, network operations, technical scope writing for projects, PLC programming, protection relay settings etc. your chances of securing that particular job and succeeding in that role will be extremely high.

The number of Sri Lankan engineers working as managers in foreign companies is comparatively low. Although the two roles associated with engineering and management are difficult to separate one from the other, and are two sides of the same coin, personnel management and project management positions in overseas jobs are difficult to gain without having demonstrated and proven skills on those areas. There are many local persons in foreign countries, who have the ability to manage a team of workers or manage a large project. As an engineer who has migrated from another country you should be equipped with special skills to contribute towards the uplift of the company rather than focusing on managing a team. As mentioned earlier too, the emphasis in such a situation is on what one could contribute towards the company and not so much on number of years on service.

As an engineer working for a foreign company you are expected to be results oriented. You should be able to demonstrate one or two assignments with results obtained. You should be able to set up your own goals. There should be a start and end to all of your assignments.

Today's engineers use numerous tools to execute their design or in their planning work. It may be a computer programme developed by another

company. Eg. PSCAD developed by HVDC Manitoba for HV transient studies. Professionals possessing such meticulously developed skills on how various tools are used to perform the required tasks will certainly have better chances of getting a job if the company in mind uses that tool or tools. Hence, experience with the use of such types of software tools will be an added advantage on finding the job you are familiar with. Most employers choose to "hire skills" rather than people.

#### 4. Work on your own

Working on your own is another skill to develop. Although some of the assignments are team work, you will be given a specific task to perform within the team. You are responsible for each and everything you are going to provide within that special area. Calling upon your subordinates or your team members for any issues arising on your work will have a negative impact on your career advancement.

Engineers working on jobs overseas are required to improve the accuracy of the job performed and to complete the assignment according to the given scope. Design engineers will have to stamp and authenticate the design hence accuracy of the design is of utmost importance. None will come forward to safeguard your career if your stamped design caused a failure. Thus, you could end up in legal confrontations for the damages caused due to your incorrect design. Accuracy therefore, of your deliverables be it a design, or a specification or any scope report must be unquestionable at all levels.

Engineers dealing with general administration activities along with personnel management or with supervising schedules or programmes will have extremely low opportunities in foreign companies. Although engineers should develop such skills, those skills alone will not determine consideration for a job in a foreign country.

#### 5. Soft skills and work ethics

Finding a suitable job according to your experience and skills may be easy for you but, keeping the same job in a longer run will be more difficult if you do not develop your soft skills. If you are a person who works from 8 AM to 4 PM regularly, you will be the first to lose the job before long. The first six months in your job is extremely important in this aspect. Until you familiarize yourself with how to find your tools to do your work you should be the hardest working employee in the company. You should always remember that they did not give you the job but that you earned it. You should never be late for any meetings or delay in completing any assignment entrusted to you. Foreign companies expect you to be proactive than reactive in situations. This is another skill that develops along with much experience in the same type of assignments. Since every

assignment is coupled with a cost factor, the management would appreciate and commend you if you could come up with proactive solutions to cut down the cost.

Mentoring is another skill for which you will receive appreciation from your management. New hires and junior engineers need continuous mentoring to perform their work. Your manager might not have sufficient time to engage in mentoring the juniors. In such instances, you could volunteer to mentor the juniors with your experience. This will help you to improve your communication skills and simultaneously earn respect from juniors. However you have to remember that you are only a mentor to the junior and not his manager.

You should always possess as well as demonstrate a positive attitude towards your work. This skill comes along with problem solving skills. Waiting for others to tell you what to do might have a negative impact on your career. You should be a problem solver rather than a passive bystander in the office.

When working in a foreign country, within your establishment, you will meet many colleagues hailing from different countries and with different cultural back grounds. Currently, there are many persons from China, India, Pakistan and East European countries working in multinational companies. You should develop a healthy working relationship with these multinationals. This may be easy to say but extremely difficult to achieve due to varying individualities. You should be a flexible person but within reasonable limits. Generally Sri Lankans are rated as easy going people who are ready to build cordial relationships with others yet hesitant to stick to any one special group in the company. There are many among us who do not wish to take up any responsibility or are not reliable and conscientious. Such individuals soon become a source of amusement in the workplace and eventually the management will lay them off. You should therefore endeavour to gain recognition by the managers as a person who is reliable and completes a given task efficiently and with minimum supervision.

This article is not by any means supporting brain-drain in Sri Lanka but to highlight some useful guide lines for engineers venturing on working in a foreign country. Perhaps most of these guide lines may prove beneficial for young engineers looking on joining the Sri Lankan workforce too.

*Contd. from page 7....*

### WHAT CAUSES....

Buddhists we should pay more attention to be exemplary in respect of more basic human qualities and ethics which we could be proud of ourselves, if they properly observed.

During impromptu discussions with many of fellow countrymen who have either left Sri Lanka or having intentions of leaving Sri Lanka in the near future for personal gains have expressed and argued with me that Sri Lanka is not a favorable country to live in as they do not have right opportunities and recognition to cater to their qualifications and likes. The most critical factor they pinpoint is that our country is corrupted and does not offer any environment conducive to serve. They are ever ready to complain about corruptions and the breakdowns in the systems prevailing everywhere in the country. They keep on boasting about the goodness and perfections of the systems in the countries they are either living in at present or planning to go to in the near future. This is really frustrating, as they tend to live on other people's achievements and paradises while not contributing their skills and talents to the environment in which they were educated and brought in. The fact remains is that they find it hard and do not want to go an extra mileage in trying to organize themselves and the community around productively. It may be that they feel inferior to deal and negotiate with our own people. Instead, they opt to put the blame on others and try to get away. As a matter of fact, many people do not appreciate the facilities and the freedom which we as citizens in this country are enjoying comparatively in our region.

One could also argue at this stage, then as to why Sri Lankan have behaved and reacted quite differently in the face of the Ealaam War and also when tsunami struck our soil in 2004. The fact remains that there were lot of common reasons conducive for us to be united and act as a unified force on both occasions. The case with our nation is that when it comes to general day to day duties, personal interests prevail over most important national issues. It is quite natural that we all tend to be somewhat selfish in general, as human beings. Nevertheless, there should be certain general ethics which we all should adhere and respect as general citizens of any country when they treat National Interests and Duties. This is based on what I believe and have been guided by those whom we respect as National Leaders who have shown us exemplary paths to follow in the past

Let me now elaborate on what made us to act quite differently during the 30 year Ealaam War. As we all know, Sri Lanka

has been severely battered and devastated continuously through out the Ealaam War which lasted for almost three decades. Most Sri Lankans have suffered or grieved directly or indirectly, during this horrified period. Those who left home in the mornings could not guarantee that they could come back home in the evenings. People were forced to undergo untold hardships economically as well as socially. These miseries which the country had to face, really forced people to get together and unite to fight and eliminate this common enemy. It is this unique situation which helped us to leave our natural selfishness aside for the sake of national interests.

Sri Lanka which was hit by the tsunami in December, 2004, had to face untold miseries and take heavy toll on its economy during the recovery period. The country as a whole had neither experienced nor really visualized the horrendousness of a tsunami disaster before. We were caught completely unaware of the event on that very fateful day. The whole nation rose together to help each other and rescue those who suffered from this mammoth devastation unprecedented in the recent history of Sri Lanka. Everybody displaying unique human qualities came forward to help each other under trying conditions. Again this event had common reasons for most of the people to unite and act together. Both these events brought drastic impacts on our economy in series. However, I still do not see that the average Sri Lankan would have behaved in the same patriotic manner under normal circumstances.

What are the causes for these indifferent behaviors and incorrigible attitudes? What steps could we take to improve and reform our society in this respect? Who should take the leading role in guiding and reorienting our society to be more responsible and disciplined in every respect? Have we, as the public, got any role to play in driving our kith and kin to be exemplary citizens in our country? How best could we address these issues? These are the pertinent questions which come to my mind immediately.

I still remember the days when Sri Lanka was going through a closed economy during the 70s with emphasis being given to import substitution policies due to shortage of foreign exchange, world wide food scarcity and spiraling of oil prices. The Sri Lankan Government quite correctly rose to the occasion and curtailed imports and stepped up agriculture production in the country to its maximum. Lot of unpopular restrictions and

regulations had to be introduced in the midst of heavy criticism by a minority 'super' class who were not prepared to sacrifice some luxuries to achieve common goals in the interest of the nation. The country was producing most of its basic commodities at that time. Although the quality of the products had not reached that of foreign goods, yet people were content with what was available under the circumstances. Regardless of heavy criticisms by a handful of politicians, the country managed somehow to survive and overcome the economic obstacles to the best of its ability. The reasons for the success and complacency could be attributed to the national feelings people had in common at that time. The people who were patriotic and national minded in the beginning were somewhat carried away by the political slogans in the latter stages. Nevertheless, the background which led to the fall of the government in 1977 is a much more complex and well orchestrated plan than what we would have thought at a glance. It is not my intention however to elaborate on the issues which led to the change of government at that time. However, there is a school of thought prevailing now that we would have been better off had we continued in a much more balanced and indigenous economic system than making it fully liberalized as it was done then.

With the change of government in 1977, the country was exposed to full scale open economy as enjoyed by most of the much affluent countries in the west at that time. All the restrictions which were in place before were removed and then people were allowed to import what ever they fancied and could afford to sell in the open market. The television media was too introduced and followed by the lifting and relaxation of rules of the National Performance Censorship Act, pertaining to screening of films, sales of printed materials and newspapers etc. New liberal moves and policies were introduced in respect of newly emerging TV and Radio channels. The curriculum for the education too was subject to an overall reform in the context of changing trends in the country. The subjects like Geography, History, Literature and Civics were removed and replaced with one general subject called Social Studies. The students were gradually distanced from the opportunities that were available for them to study and familiarize themselves with the ideologies and life stories of our national leaders who had guided and motivated us in the past. The access to study literature and make them to appreciate good

literary works of poets and renowned writers in the class room itself was changed and removed. The students were directed to confine themselves to class notes and handful of textbooks only. The good reading habits of children thus began to disappear leaving us with a young generation with limited all round knowledge and degraded human qualities. The new generation was oriented to be more and more competitive and self oriented so far as to get through their exams only. The urge to maintain the inter-family relationships and neighborhood connections started to erode away in view of limitation of time available for social events. Another very important factor which has contributed to the denudation of inter-family and the neighborhood relationships is the campaign introduced by the government in office in the 80s to encourage people to cut down the numbers in each family to 3 or less as a step towards reducing population growth. The family bonds that were created and maintained through out generations too were affected due to reduction of family size and changing values of the environment. The introduction of TV, TV Games and the Internet has had drastic impacts to our culture and family styles. All these factors have attributed to the sorry state of our cultural values and attitudes. It is my firm view that we as a country should have been more careful and prepared before opening these new windows to the modern world. The country as a whole could not sustain the sudden flooding and inflow of erratic global information and influence. The overall impact has been more harmful than useful to our society in general. The same could be said about the relaxation of the controls in the economy to allow imports to flood our market with everything with no considerations given to our local manufacturers and growers. It is very interesting to observe that these kinds of fully liberalized policies are not implemented without any protection to local industries and growers even in countries from where we have borrowed them.

We as general citizens should recognize the importance of identifying the evils and weaknesses in our society and make a concerted effort to contribute in whatever manner we could in order to improve and remove the roots and causes affecting ourselves. It is our utmost responsibility to direct, guide and advice our children to be more responsible and dutiful citizens by making a start at home itself. Give every support and encouragement for them to get back in to the habits of reading books on other subjects other than what they study at the school. As parents we have to be exemplary and advise our children how they should mould their life to be dutiful and righteous in the society. Provide every support and facility to engage your kids in extra-curricular activities. The importance of them involving in dramas, literary activities, and also sports should be emphasized. Engaging in sports will enable them to experience

team work and interact with each other, whilst facing victory as well as defeat in life in the same spirit.

The education curriculum has to be so designed to cater to such needs of the society. This exercise may have to be extended to even the Nursery Education prevailing in the country which I suspect could be an impediment to our society. Perhaps, designing and introducing new subjects in to the curriculum will help to inculcate patriotism and dutifulness in the minds of younger generation. It is very important that the Sri Lankan citizens are unified and brought under one nation to think and react with no division in terms of cast, race or religion. The temples and all religious places in the country have a more responsible role to play to influence and advice the children and the adults in the right direction. The unity and harmony among the multi ethnic groups in the country will act as a valuable asset for achieving the prosperity of the nation in the future. The priority and emphasis given at present for Sinhalese and Tamil as a second language for all government servants is a very progressive step taken by the government to promote and develop the mutual understanding between the multi-ethnic groups in the country. Strengthening of English Education at schools as an International Language is also equally important to bridge any gaps prevailing in the society in terms of communication.

One more very important and critical area which has to be addressed in this respect is appointment of a Presidential Commission to examine the causes for these weaknesses and recommend to the government as to what actions taken in Education and Multi-media to promote and raise the younger generation to be more responsible, dutiful and patriotic towards the society. This commission obviously has to comprise of learned representatives from all religions, educationists, sociologists and legislators. It is proposed that the recommendations which come out of this be carefully studied and deliberated by the government immediately and action taken to implement whatever steps that should be taken treating this as a national priority of the highest level.

It is a common view that politicians in Sri Lanka set bad examples to the society. My personal view is that we should be blamed for electing wrong representatives to the Parliament in the first place. Secondly, I think that once the society is reformed and rehabilitated to produce good and dutiful citizens naturally we would get a new breed of righteous and honest politicians too. For that, we all will have to act together and be patient for a dream nation to evolve.

16<sup>th</sup> December 2011

# Agricultural and Construction Machinery



## AGGREGATES TESTING



Sieves with woven wire mesh



Electromagnetic Sieves shakers



Los Angeles abrasion machine



Moisture tester



Automatic binder extraction unit



Centrifuge Extractor 1500/3000g capacity

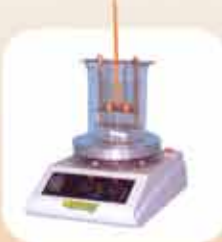
## BITUMAN TESTING - ASPHALTS



Automatic marshall compactor



Rolling thin film oven



Ring and ball softening point apparatus



Saybolt viscometer, two tube



Marshall digital water bath



Vacuum pycnometer (rice test)

## CONCRETE TESTING



Penetrometer



Ductilometer



Slump cone test set



Complete range of steel and plastic moulds



Poker vibrator



Curing tanks for concrete specimens



Concrete test hammer



Complete range of core drilling machines



Blaine air permeability apparatus



Flow table



Mortar mixer



3 gang verified mould for prisms 40,1x40x160

## SOIL TESTING



Vibrating machine for 70,7 mm cube moulds



Digital triaxial load frame, 50kN capacity



Universal multi-speeds load frame, digital, computerized



CBR/Proctor compactor automatic, universal



Motorised sand equivalents shaker



Liquid limit devices

## GENERAL TESTING EQUIPMENT



Blue methylene test



Premeameter stand



Balances: mechanical analytical, digital



Balances: mechanical analytical, digital



Scoops



Laboratory glassware

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