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## INAUGURATION OF IESL STUDENT CHAPTERS

**R**evealing a novel chapter of IESL history as well as of the Faculty of Engineering, University of Ruhuna, the inauguration of the IESL Student Chapters was held on the 20<sup>th</sup> of April 2011 at the Ruhuna Engineering Faculty, with the presence of IESL officials, the academic staff of the faculty and students.



The ceremony was commenced at 14.00hrs by lighting the oil lamp. Welcoming the guests, the Chairman of the Young Members' Section Eng. Ranjith G. Rubasinghe explained the objectives of forming a Student Chapter and how it could favor the engineering undergraduates whose aspire is to be a competitive future professional. "The formation of student chapters of the IESL can be used to recognize the contributions made by the students as they learn and engage themselves in professional activities related to engineering. We hope that this would help disseminate knowledge, theory and practice of aspects related to the relevant discipline of engineering, advance the professional development of the Students during their tertiary education programme and encourage socially responsible acts among students."

He further mentioned that the President of IESL, Eng. (Prof.) A K W Jayawardane had the first thought of forming Student Chapters, foreseeing how it can strengthen the relationship between engineering undergraduates and IESL.

Following the welcome address, Eng. (Prof.) A K W Jayawardane, President of IESL did a valuable speech.



Dr. A M N Alagiyawanna, the Dean of the Ruhuna Engineering Faculty also addressed the guests. He mentioned that the faculty was fortunate to start the very first IESL Student Chapter, despite being the youngest engineering faculty in the country.

Addressing the gathering Eng. G Wijesekara, the Chairman of the IESL Southern Provincial Center, stated that new engineering graduates encounter various challenges once they are exposed to the industry and how they should strive to overcome such difficulties.

Then was the most anticipated key note speech by the Vice President of IESL, Eng. Shavindranath Fernando. He did a motivating

one's career as an engineering undergraduate.

Further, The Senior Treasurer of the chapter Dr, H P Sooriyarachchi was introduced to the gathering and was invited to chair the meeting for the election of office bearers. The office bearers were elected by the students for the positions of President, Secretary, Vice President, Vice Secretary, Treasurer and three committees each consisting of three members. Afterwards, the gathering was also addressed by the newly elected Chapter President.

The constitution of the Chapter was brought forward by the senior treasurer of the chapter. After proposing a

number of amendments, the constitution was approved and the name of the chapter is announced as Ruhuna Engineering Student Chapter of the Institution of Engineers Sri Lanka (RESC-IESL).

The vote of thanks was done by the Executive Secretary of IESL Eng. Ms. Arundathi Wimalasuriya. The inauguration meeting of Ruhuna Engineering Student Chapter was dismissed after the National Anthem.

Followed by this event, the student chapter of Faculty of Engineering, University of Peradeniya was also established on 27<sup>th</sup> April 2011 at their faculty premises.



The Welcome speech was delivered by Eng. Ranjith G. Rubasinghe and the gathering was also addressed by Mr. W R M U Wickramasinghe, Senior Lecturer/Director, Industrial Training and Career Guidance Unit, Faculty of Engineering, University of Peradeniya, Eng. Jayantha Ranathunga, Past President, IESL, Chairman/ Central Provincial Centre, IESL.

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# Meet your Council 2010 / 2011



**Eng. Gratian A Peiris**

**CHAIRMAN**

**MECHANICAL  
ENGINEERING  
SECTIONAL  
COMMITTEE**

**FCMA, B.Sc.Eng., C.Eng., M.I.E. (S.L.)**

**G**ratian A. Peiris is a Chartered Mechanical Engineer as well as a Chartered Management Accountant with over 31 years of experience in Engineering, Accounting, Development Banking, SME Development, Community Development, Business Promotion, Project Formulation, Implementation & Management, Corporate and Business Management, Capacity Building and Training.

During his 17 month tenure as the Chairman of the State Engineering Corporation from June 2004 to November 2005 he engineered the turnaround of the SEC rescuing it from bankruptcy and ending a four years of losses, putting the Corporation back in profits. He was also the Co-Chair of the National Council for Economic Development (NCED) Construction Cluster and the Convener of the National Think Tank on Construction Industry. He was a Director of the Industrial Technology Institute (ITI) from 2006-2008, the Honorary Secretary of the Institute of Engineers Sri Lanka (IESL) in 2006/07, and a Council Member of the Chamber of Construction Industries from 2004 to 2009.

Gratian presently specialises as a full-time versatile multi-disciplinary consultant. Since 2007 he has been retained by the GTZ in Manila as their Value Chain Expert and Moderator of workshops, and forums, and the staff development consultant to work in Brunei, Indonesia, Malaysia and Philippines. He is a member of the Engineering Faculty Board of the University of Moratuwa and a member of the National Task Force for Flood Mitigation, appointed by the Ministry of Defense.

In 1983 he started his career as a Project Engineer at the Central Engineering Consultancy Bureau (CECB), Sri Lanka, and worked in the Victoria Project (210 MW) and Canyon Phase II Project (20 MW). In 1987 he joined the DFCC Bank as a Senior Project Officer and handled a wide range of large-scale, SMI, export, tourism, agriculture, and rural development projects. From 1989 to 1992 he served as the Project Accountant of the Fiji Sugar Corporation (Fiji Islands) managing projects worth US\$ 50 M. He migrated to Australia in 1992, and worked as the Special Projects Development Officer and then as the General Manager of MIA Business Enterprise Center Ltd, a business counseling, training and regional development agency. Thereafter he practiced as an Austrade accredited Management Consultant in Australia.

On his return to Sri Lanka in 1997, he accepted the offer from the DFCC Bank to function as the Senior Portfolio Manger of Lanka Ventures Ltd. In 1999 he turned around Green Soils (Pvt) Ltd. for the Swedish Trading Group as the CEO, and then formulated and successfully negotiated the second multi-storied housing project for families living in under serviced settlements with the Real Estate Exchange (Pvt) Ltd, as the Chief Operating Officer of Town & Country Developers (Pvt) Ltd, a member of BMI Holdings.

Since September 2001 Gratian is exclusively engaged as a Business and Management Consultant undertaking business and development consultancy work. He has acted as the Team Leader and Senior Consultant for many projects funded by ADB, NORAD, IFC, USAID, GTZ etc.

Gratian has completed many Business Plans and Corporate Plans for clients in Sri Lanka and Australia working as the Team Leader as well as a key member of a small team. He has a unique public-private sector mix of exposure and experience to combine with his multi-disciplinary qualifications and experience, making him the ideal consultant for organization development and restructuring initiatives.

Gratian is an accredited business counsellor, trainer, business facilitator, a management consultant. He has published a collection of Sinhala and English poems. Gratian has been trained in Germany, Japan, Philippines, India, Sri Lanka and Australia. He has a wealth of experience in lecturing on management, teamwork, costing, economics, venture capital, project formulation and evaluation in Sri Lanka and Australia and facilitation and moderation of many international workshops in a number of countries.



**Eng. Mahesh Lakshitha Weerasinghe**

**REPRESENTATIVE MEMBER**

**Age : 44 years**

**BSc Eng(Hons), CEng,  
MIE(SL), MIEEE(USA)**

**Chief Engineer  
(Business &  
Operational Strategy) –  
Ceylon Electricity Board**

**E**ng. Lakshitha Weerasinghe Graduated from University of Moratuwa in 1994 with a First Class Honours Degree in Electrical Engineering.

Eng Weerasinghe Commenced his Engineering career in 1994 as a Maintenance / Production Engineer at ACME Printing & Packaging Ltd. He joined the Ceylon Electricity Board in 1996 as an Electrical Engineer and worked at the Samanalawewa Power Station between 1996 to 2000, first as an Operations Engineer and later as the Maintenance Engineer (Control &

Instrumentation). He engaged in postgraduate research during the period 2000 - 2002 at the University of Peradeniya and Royal Institute of Technology, Sweden. In 2002 he was posted to the System Control Centre of CEB and was working as a System Control Engineer till February 2006. In February 2006, he was appointed to the post of Chief Engineer (System Operations) at the System Control Centre. He held this post until he took over the post of Chief Engineer (Business & Operational Strategy) at the newly formed Corporate Strategy Division of CEB in April 2011.

Eng. M.L. Weerasinghe became a Corporate Member of IESL in 2000. He has been actively involved in IESL activities and has been the Editor of 'Sri Lanka Engineering News' since 2004. He has served in the Council representing Members under 40 during

the sessions 2005/2006 and 2006/2007 and representing Members over 40 in 2007/2008, 2008/2009 and in the current council. He has also served in a large number of committees appointed by IESL. He has been serving in the Editorial Board since 2004 and is currently a member of the Library, Publications, Publicity and Conference Committee, National Engineering Heritage Gallery Project and Power Sector Committee. He is also a visiting lecturer of IESL and has served in the panel of Examiners for the Professional Review examination.

Eng Weerasinghe is also a Member of the Institution of Electrical and Electronics Engineers (IEEE), USA and a founder Member of the IEEE Local Chapter.

He won the 'L S De Silva Memorial Award' for the best performance at the Professional Review Examination in 2000 and the ANTON Award in the same year for the best project under 35 year category in the "Water Related Infrastructure Competition".

**Eng. (Brig.) Kurukulasuriyage**

**Dewapriya Asoka Perera**

**REPRESENTATIVE MEMBER**



**Age : 65 years**

**CEng., MIE(Sri Lanka),  
MIE(India)**

**Chief Operations Officer –  
Micro Constructions (Pte)  
Ltd.**

**E**ng. (Brig.) K D A Perera graduated in 1993 from the College of Military Engineering, Pune, India. He became a Member of the Institution of Engineers, Sri Lanka (IESL) in 1998 and since 2003 has been a Corporate Member of the Institution of Engineers, India.

He commenced his career in 1967 as an Irrigation Learner at the Irrigation Department and served the Department as a Technical Assistant during the periods 1968-1969 and 1972-1973. Between 1969 and 1971, he was attached to the River Valleys Development Board as a Technical Assistant. In 1973 he joined the Sri Lanka Army as a Garrison

Engineer and held the posts of Garrison Engineer II – Panagoda Cantonment and Officer in Charge of Engineering Stores as a Lieutenant, Garrison Engineer (Jaffna and Mannar) as a Captain and Officer Commanding, Works Squadron at Anuradhapura and Colombo. Between 1987 and 1988, he was attached to the Structural Design Branch of the Buildings Department. He as a Major was the Second-in-command, Works Services Regiment between 1989 and 1990. Upon his return to the island from India in 1993 after successfully completing the three year engineering degree, he was made a Lieutenant Colonel and assigned as the Commanding Officer, 2 Engineer Services Regiment, Anuradhapura for a period of one year. From 1994 to 1995 he served as a Colonel in the capacity of Commandant, Regimental Centre. During the periods 1995- 1996, 1996-1998, and 1998-2000 he served as Colonel AQ -

3 Division, Batticaloa and as a Colonel in the Directorate of Engineering Services, and thereafter promoted to the rank of Brigadier and appointed as the Director of Engineer Services. At the time of his retirement from the Sri Lanka Army in the year 2000, he was serving as the Colonel Commandant in the Corps of Engineer Services.

He thereafter joined the Civil Engineering Department of Samuel Sons & Co. Ltd., as a Deputy Manager (Construction) where he served in that capacity till 2001. He was promoted to the post of Manager (Civil Engineering Dept.) in the year 2001 and worked in that capacity till 2003 when he left Samuel & Sons. Co. Ltd., to join the Construction Guarantee Fund as its Chief Monitoring Officer where he worked till 2007. For a short period of three months he was attached to the CEC as its Chief Operations Officer and in the year 2009 joined Micro Constructions (Pte) Ltd as its Chief Operations Officer, a post he holds to date.

*Contd. on page 11...*

## Meet your Council 2010 / 2011



**Eng. (Dr.) P B  
Wickrema  
Muneege**

**REPRESENTATIVE  
MEMBER**

**Age : 38 years**

**PhD (UK), PG (Dip), B Sc Eng(Hons), CEng, MIE(SL)  
Chairman – Sri Lanka Ports Authority**

**D**r. Priyath Bandu Wickrama is presently the Chairman of the Sri Lanka Ports Authority which post he took over in 2008. The Sri Lanka Ports Authority was created in 1979 by an Act of Parliament to develop, maintain, operate and provide Port and other services in the Sea ports of Sri Lanka. As the Chairman of the Sri Lanka Ports Authority he is responsible for conducting of business of the Establishment and managing Sea ports in Sri Lanka and ensure that each of them is a self supporting Enterprise in order to facilitate the enhancement of Sri Lanka's image as a major maritime nation.

Dr. Wickrama graduated from the University of Moratuwa, Sri Lanka with a BSc Honours in Mechanical Engineering. He was conferred with a Doctorate in Operation Management by the International University of America in the United Kingdom.

He, in his capacity of the Chairman of the Sri Lanka Ports Authority is spearheading the construction of two Mega Port development projects in the Country. The first being the Greenfield port of Magampura (Mahinda Rajapakshe Port) in the Southern region commenced its operations from 18<sup>th</sup> November of 2010. The second is the Colombo Port expansion project whose first phase when completed by early 2012 will enhance the container handling capacity by a further 2.4 million TEU's.

He is also the Chairman of the Jaya Container Terminals Ltd., which was incorporated in the year 2002 as a 100% Sri Lanka Ports Authority owned Public Company with limited liability.

He also functions as the Chairman of the Sri Lanka Port Management & Consultancy Services (Pvt.) Ltd., which is the main supporting service provider of the Sri Lanka Ports Authority.

He holds the post of Chairman of Peliyagoda Warehouse Complex Ltd. Dr. Wickrama is a Director of National Paper Company LTD and also he is in the Director board of Urban Development Authority.

Dr. Wickrama hold the council membership of IESL from 2006. He is a committee member of IAPH in the area of Port Planning and Development Committee. He is a affiliate member of the Chartered Institute of Marketing since 2010.

## Induction & Graduation Ceremony 2011

**The Induction and  
Graduation Ceremony for  
the year 2011 will be held on  
August 19, 2011 at the  
BMICH, Colombo.**

## A Case for a Dedicated Authority and Traffic Management System for the Southern Expressway

by Eng. Yasoja K.R.Gunawardena

**A**n effective traffic monitoring and management system is an important requirement for the smooth and efficient functioning of a dedicated expressway.

Given that the Southern Expressway is the first of its kind in Sri Lanka this presents a unique opportunity for a dedicated traffic management system to be put in place for the smooth functioning of this expressway.

This is vital for a number of reasons a few of which are outlined below

- ◆ Potentially this expressway will be the primary route of freight transport from the Western province which is the commercial hub of the country to the South – an emerging trade hub of Sri Lanka with its port and new airport
- ◆ This puts greater significance in ensuring that the expressway is kept operational and that traffic flows smoothly – to minimise any disruption that may be caused to freight traffic as well as regular traffic especially the dedicated airport traffic that will be using this highway once the Mattala International Airport becomes fully operational

In order to ensure this operational requirement a dedicated traffic management plan and system should be in place.

Many Western countries especially those in Europe and in the USA have quite advanced networks of highways which serve as the arteries of those respective economies. In these countries traffic management systems are in place to keep these arteries running smoothly. Some of the key general features of such systems are given below.

- A dedicated authority has been setup with the responsibility of ensuring the smooth functioning of the expressway as well as ensuring the planning and implementation of traffic management systems. The Highways Agency in the UK is an example.
- Traffic monitoring systems at major intersections, busy stretches as well as stretches of road more prone to accidents have been setup. These are in the form of CCTV and/or inductive loops which also can serve as a traffic counting system.
- Together with this monitoring system a dedicated setup of patrolling, pick up and rescue and traffic control/regulation has been setup. These include dedicated highway patrol officers, breakdown services, teams to setup dynamic road markings/lanes in case of closures of exits/lanes due to accidents as well as law enforcement officers to enforce speed limits on the network.
- Alternate routes in place for traffic in case of closures of sections of the highway.
- Real time advice through the media and the internet advising travellers of the traffic situation on the road network

Another key feature in the systems that are in place in Western highway networks is the implementation of traffic weight measuring surveys on sections of their road network, especially sections that heavily trafficked by heavy freight vehicles. These traffic surveys which are done remotely through instrumentation (such as inductive loops) laid on the road give information regarding the frequency and weights of the vehicles that use the road network. These surveys have formed the basis of many traffic load models which are used for the design of highway bridges in those countries.

Given that the Southern expressway is a newly constructed highway this gives the authorities in Sri Lanka a unique chance to obtain similar information about the heavy freight traffic that traverse Sri Lankan roads. Such a study could incorporate the following salient features;

- An inductive loop based system can be installed on a stretch of the road network which is expected to be quite busy in terms of traffic, with the data logging equipment installed on the roadside. This system would have the capability to both measure the number of vehicles passing through as well as the weight of the axles. Separate video recording of the instrumented site can take place concurrently and later be used to verify the logged data.
- If such a system is deemed too expensive to be viable a simpler manual traffic counting system and selective measurement of heavy vehicles (both dimensions and axle weights) by directing them to the roadside and/or exits to be measured with weigh-pads/ weigh-bridges can be implemented. The RDA and the Transport and Logistics Department of the University of Moratuwa who have experience in this area having conducted similar studies for axle weights can be utilised for such a study.
- From the data obtained in this manner a traffic load model based on statistical concepts can be formulated which will provide a comparison to the actual design loads used for bridge design in Sri Lanka as well as a basis for formulating realistic and more enforceable vehicle weight limits. This would be of paramount importance as research using the RDA axle load survey data has shown that a significant number of vehicles that traverse the roads do not comply to the vehicle weight limits and that in some cases the design loading used for bridge may also not be accounting for the extreme vehicle loads on the roads. This will enhance the confidence in the safety and reliability of the highway and its bridges rather than having to rely on the inherent reserve strengths that are found in structures to take the extreme loadings.

Therefore the implementation of a traffic management system will not only contribute towards maintaining the functioning of the Southern expressway to a high standard but it will also provide a blue-print into how the expanding highway (expressway) network in Sri Lanka can be effectively managed to maximise efficiency of travel. Furthermore, traffic management systems will also further knowledge with regards to the loads that need to be used for highway bridge design in Sri Lanka. This would result in an increased reliability of the bridge network in the country as well as promote learning and research in this field.



Sri Lanka  
Engineering News

## Changing the Game! -Green Ratings for countries

**C**redit Rating is an index that tells the credit worthiness of an individual, corporation, or even a country. On a scale ranging from AAA to D, Sri Lanka is currently on a "B" rating which is far from satisfactory. Credit Rating of a country indicates to a lender or an investor the risk he undergoes in making an investment or lending to a country. Thus, based on the Credit Ratings, borrowers have to face many obstacles in securing a loan or an investment including higher interest rates. If Sri Lanka improves its rating, we will be able to attract cheaper interest rates.

The credit rating is one of the "qualifications" developing countries like ours have to prove in order to attract funding and compete with others in our quest to achieve the ever elusive Development. In a world full of advocates of the "Free market" economy, there are umpteen numbers of such barriers for countries like ours to enter and compete with others on an equal footing. They are termed as "non tariff barriers". Some of these are mere ploys to protect their local producers from outsiders.

In a world that is becoming increasingly environmentally conscious, the time has come for us to propose another standard that will certainly give us an edge over the rest of the world; A **Green Rating** for countries! This proposal is well in line with what the western world preaches and thus would find hard to reject.

A country's Green Rating can be based on factors like the per capita Carbon Foot Print, sustainability of its consumptions, forest cover within the country that act as a Carbon Sink etc. If this could be made an important consideration in foreign trade, all countries would strive hard to balance out development with sustainability and environmental considerations as not doing so would violate their Green Rating. This will compel the world to make its development sustainable and environment friendly. At the same time, this would help countries like ours, which have been better "Global Citizens" than most of the developed countries and thus naturally have a better Green Rating to have an edge over the others in international trade.

Sri Lanka must now look beyond merely playing the game according to the rules set by the western world. The time is now opportune to "change the game" itself and draw others to play in a territory that we have an edge. A "Green Rating" system can be an important strategy in achieving just that. I wish and hope (as I always did) that this short editorial would draw the attention of those who can convert a simple notion like this to a practical concept of value.

Lakshitha Weerasinghe, Editor  
lakshitha@iee.org



## Letters to the Editor

### Time to change the colour of school uniform

by P W Bamunusinghe  
Upper Kotmale Hydropower Project, CEB

In families which have school aged children, washing and ironing of school uniforms contribute the most on electricity bills. Being a tropical country, in the most of areas, white coloured school uniforms dirty easily due to dust. White coloured school uniforms are washed and ironed daily and considerable consumption of electricity is involved with this process.

Instead of white coloured uniforms, if we could introduce a dark coloured trouser for boys and a dark coloured skirt for girls (frock used at present is to be changed to skirt and blouse or shirt), the frequency of washing and ironing could be brought at least to half thus reduces consumption of electricity. Ultimately, considerable saving of energy can be achieved annually as far as numbers of school children are concerned.

As examples, colours of school uniforms in several countries are considered. In Japan, in summer, ash coloured trousers and skirts with white shirts are used while in winter, black or dark blue coloured trousers and skirts with white shirts are used. In Thailand, black coloured trousers and skirts with white shirts are used. In India, uniforms in different colours are used.

I have no reliable facts to prove reasons why above countries have introduced coloured uniforms. But in our country this could be implemented with the intention of saving energy. IESL may draw kind attentions of Honorable Ministers of Power and Energy and Education regarding this please.

## A Spaceport in Sri Lanka (SLEN January 2011)

### (Reply to Eng. Kapila Peiris's Comments)

**E**ng Kapila Peiris has made an interesting comment on my above mentioned article and here is my reply for his query regarding the Frame of Reference that I am using for the orbital dynamics of an earth orbiting spacecraft.

He says that "In our normal day to day Engineering work we consider earth as our inertial frame". Strictly speaking, the frame of reference Eng Kapila Peiris is referring to is not an inertial frame in the Newtonian sense. In Newtonian Mechanics an inertial frame is one that is moving in a straight line at constant velocity (or zero velocity) with no fictitious forces such as the coriolis and centrifugal forces. The frame of reference that Eng Kapila Peiris has been using for his day to day work is the stationary 'Flat Earth' model that even many primitive tribes have been using for millennia. Of course in contrast with those primitive people, we engineers, who are well aware that the earth is not flat, know that that it is an approximate model only. For certain limited applications, *such as a falling slinky spring*, it is an adequate model but not when one wants to deal with more advanced tasks such as space technology. The inadequacy of the model even for earthly problems is exposed the moment we try to explain a simple phenomenon such as the vortex seen in a draining wash basin.

Even if we forget the flat earth assumption, Eng Kapila Peiris's 'inertial frame' is really not an inertial frame because it has several superposed motions, such as the earthly motions (axial rotation, precession and nutation of the axis and the motion around the sun) and motions due to the orbit of the sun around the center of mass of the Milky Way Galaxy and the motion of the galaxy itself relative to other galaxies. May be in the future, more motions such as that of our local universe itself with respect to other so far undiscovered 'parallel' universes could be discovered.

One cannot blame Eng Kapila Peiris for calling his 'flat earth model' an 'inertial frame' because what is described as an inertial frame in Newtonian Mechanics is an ideal that cannot be found in practice. The reason is that, to decide whether a frame of reference is moving in a straight line at constant velocity or not, one needs absolute points of reference. The fact is that there are no such points anywhere in the known universe. These reference points were considered to be distant stars in the past. But it is now known that the even such stars are in continuous motion relative to each other. Due to these difficulties, the definition of an inertial frame has been changed to one where the Laws of Motion are the simplest and where there will be no fictitious forces.

Once a spacecraft is in orbit, its motion is considered relative to a frame of reference with the center at the center of mass of the earth and the axes fixed in direction with respect to the distant stars. This is shown in the second Fig in my article (SLEN January 2011). The frame itself orbits around the sun with the earth and hence is not an inertial frame. Thus we can imagine the 3-D figure referred to above orbiting the sun, together with the earth, with the orbital plane always inclined in the same direction in space. Essentially, what we have is a 2 body model consisting of the Earth and the Spacecraft only. In practice however, perturbations occur due to the effect of other heavenly bodies such as the sun, moon, other planets,

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## PROVINCIAL NEWS

### PROGRAMME ON CARRIER DEVELOPMENT FOR STUDENTS OF FACULTY OF ENGINEERING, UNIVERSITY OF PERADENIYA

sent by Eng. Wasantha Illangasinghe  
Editor IESL- Central

The Institution of Engineers, Sri Lanka Central Province Centre has organized a half day awareness programme for the engineering under graduates on their future career development with the objective of preparing future Engineers to take up challenges in the fast changing and highly competitive world. The programme was held on 30<sup>th</sup> April 2011 at EOE Pereira Theatre, Faculty of Engineering, University of Peradeniya.

The resource person was Mr. Jayantha Fernando, Director, Global Talent Coach and Consultants (PVT) Ltd, a passionate professional who has obtained numerous experiences in the field of Human Resources Management and has been involved in coaching & developing people for business success in various organizations through similar programmes.

The chief guest, Eng. Nihal Rupasinghe, the Chairman of Central Engineering Consultancy Bureau, one of the most prestigious and outstanding engineering organizations in Sri Lanka, delivered the key note address at the inauguration of this important event.

Undergraduates from all four years who are currently engaged in the Engineering course participated in the programme. The day started with the lighting of traditional oil lamp. After the welcome speech by Eng Luxman Attanayake, the Chairman of the IESL Central Province Centre, the chief guest Eng. Nihal Rupasinghe with vast experience in the engineering discipline delivered the key note address.

Thereafter, the students were exposed to various aspects of carrier development and personnel developments, etiquette, facing interviews, presenting your self in the business field, as well as in the society. The participants very enthusiastically listened to the speeches given by well experienced speakers and actively participated in the discussions followed.

The programme was so interesting and had to continue late in to the day until 3.00pm and the general conclusion was to have this kind of programme every year in order to prepare the young graduates entering the society more prepared to face the challenges in the fast changing and highly competitive world.



Programme Inauguration



Address by Chairmen(IESL)- Central



Mr. Jayantha Fernando addressing the gathering



Undergraduates participating in the programme



Eng. Nihal Rupasinghe, Chaiman, CECB addressing the gathering

### THE INSTITUTION OF ENGINEERS, SRI LANKA CENTRAL PROVINCE CENTRE ANNUAL GENERAL MEETING 2010/2011



The Annual General Meeting of IESL Central Province Centre was held at Mahaweli Reach Hotel, Kandy on 17<sup>th</sup> September 2010, with the presence of 112 engineers. The AGM was chaired by Professor A.K.W. Jayawardane, (President, IESL). The Patron and Guest of Honor was Captain M.G. Kularatne, Managing Director MAGA Engineering PVT Ltd. and the presidentelect IESL for the following year. Key note speech was delivered by Eng. N. Rupasinghe, Chairman of the Engineering Consultancy Bureau. Though a technical speech, the humorous fashion used in delivering was very much appreciated by the audience.

Eng. D.G.R. Ranasinghe (JIY representative) welcomed the members. He expressed his sincere thanks to the outgoing membership. The following officers were elected to the new committee of IESL Central Province 2010/2011. Chairman, Eng. M.A.M.S.L. Attanayaka, Secretary, Eng. W.G.C. Lasantha Weerasekara, Asst. Secretary, Eng. D.M.P. Dissanayaka, Treasurer Eng. Chandana Namal Thilakasiri, and Editor Eng. Wasantha Illangasinghe together with other committee members.

The new chairman Eng. M.A.M.S.L. Attanayaka addressed the gathering and thanked all the members who elected him as the Chairman for this year. He pointed out that after thirty years long war there is a big role for Engineers is developing the country. Human resource development and technological advancement also shall take place in parallel. The Engineers shall be innovative and be role models.

He requested the membership to come up with suggestions for new activities to be carried out during the year 2010/2011, so that the year would be full of useful and innovative activities. A lively discussion followed.

The vote of thanks was proposed by the former Secretary Eng. B.H.U.S. Bandara. The meeting was adjourned at 19:15, followed by fellowship.

## Some Recollections on Rambukkan Oya Project

by Eng. Palitha Manchanayake,  
B.Sc(Eng) Hons, M.Eng.Sc(NSW),  
F.I.E(Sri Lanka), C.Eng. Sydney, Australia

One of my friends in Sri Lanka had seen this feature article on the Construction Work that is going on of the Rambukkan Oya Reservoir Project which appeared on the Sunday Observer of 17<sup>th</sup> October 2010, and he was kind enough to send me a copy of it. After reading that article, I was so happy and delightful that I thought I would jot down my impressions and some recollections on this project.

Rambukkan Oya was one of the two projects that I spent the first two years of my engineering career in 1973-74. When I joined as an Engineer at the Planning Branch of the Irrigation Department Colombo, the responsibility of carrying out of the Operational Studies, the Flood Studies, and the Economic Evaluations for the multitude of options, and the subsequent preparation of Feasibility Reports for Rambukkan Oya and Muthukandiya Reservoirs were entrusted to me. I had one Technical Assistant G.V. Wijesiri to help me with the field work, and we two had to start the project from scratch. It comes to my mind, that when we first visited the sites, we had to trek through thick jungle, the terrain frequented by the famous author Dr. R.L Spittel and vividly narrated in his famous books on Aborigines and wild life like 'Savage Sanctuary' (translated into Sinhala as 'Wana Sarana') and 'Wild White Boy' ('Sudu Vedda'). Dr. Spittel, though being a Surgeon by profession, while serving as the District Medical Officer (DMO) at Maha Oya, had frequently visited the Vedda populated area at his leisure time as he was a wildlife conservationist. He had developed good communication skills with the Vedda Community, being their trusted friend and healer and was fondly remembered as 'Sudu Hura' translated into English as 'White Friend' particularly by Tissahamy, the Vedda Chieftain at that time.

Myself and Wijesiri started off from Colombo on a Four Wheel Drive, and proceeded to Maha Oya Junction. We made some enquiries from the town, and managed to organise a "Shikaari", a casual labourer from the area who was conversant with the jungle and the locality. We agreed to pay him the wages of a casual labourer, which was about Rs. 7/50 per day at that time, for the entire period for which he was going to be with us. He possessed a shot-gun, I presume it was an un-licensed one, and he took the lead into the jungle. We had to follow him, and we walked through the thick jungle. Even within the jungle, there were set pathways of some sort, which were being used by the wild beasts in their roaming. This "Shikaari" knew all the details about the jungle and the geography very well. He knew each of the embankments and the hillocks and guided us on the way. We started our journey with 'One inch to a mile' Topo Sheets of the area and the Motor Map in our possession and if not for the 'Shikaari', we would not have made it. Further, he expressed concerns about the roaming wild elephants, the bears and the wild buffaloes who were likely to encounter. If we happened to confront them, he indicated that it is not going to be easy. When the wild beasts pass through the canopy of leaves, the ticks from their body get onto the leaves, and while we take that route it is quite common that the ticks would get onto our skin, something we need to be cautious of. We had to spend quite a number of days there, first with the initial inspections, and thereafter with the subsequent ground surveys such as the dam site, spillway site and the river bed surveys etc. and we had to plan out the whole project. I could remember a lot of un-plucked oranges, lemon and lime that were hanging down from the trees, and they were found in plenty under the trees fallen already, and no one claiming for them. We managed to bring home a few gunny bags of them on our return journeys.

I could still remember some of the areas such as Nilobe, Kurunduvinne and Pollebedda that the Vedda population was occupying. Nilobe had one school with 40 students and two teachers, husband and wife, covering the full education of the school. While having a chat with them, I can vividly

Contd. on page 11...

## THE LIGHTER SIDE OF OUR PROFESSION



### Nothing Engineering about it!

### Forgot to sign<sup>2</sup>!

by Eng. P W Bamunusinghe,  
Upper Kotmale Hydro Power Project, CEB

Due to busy schedules of day to day life, engineers forget to sign attendance registers as they arrive at or depart from their work places. In instances where one could not sign for arrival or departure, it is a common practice to sign at the bottom of the page allocated for particular day. Usually, signature with date and time is put with the phrase "Forgot to sign"

One fine morning, in the engineers' attendance register of our office, we found the usual phrase "Forgot to sign" but without any signature. We easily identified that the phrase was written on the previous day by one of our colleagues who is renowned for his absent minded behavior. Needless to say this incident created an amusing atmosphere in the office.

Later, upon inquiring from him, we realized the reason for not signing.

On the particular day, our colleague had forgotten to sign as he arrived at the office in the morning. While working, he had suddenly realized that he could not sign for arrival. Thus, he rushed to the room where the attendance register was kept. No sooner he completed the phrase "Forgot to sign", a peon came and told him "හදිසි වැඩකට සර්ට බොස් එන්න කිව්වා" (Boss asked you to come for an urgent matter). He immediately complied and left but forgetting to sign in front of the phrase "Forgot to sign"!

THE INSTITUTION OF ENGINEERS, SRI LANKA  
120/15, Wijerama Mawatha, Colombo 7.

Tel. 0112 698426 - 209, 210, 211 Fax : 011 2 699202, E-mail : deetiesl@sltnet.lk

### CONTINUING PROFESSIONAL DEVELOPMENT (CPD) COURSES FOR THE SESSION – 2011 REGISTRATION FORM

Those who wish to follow the courses indicated below, please perfect this form and return the same to the IESL. Please mark "X" in the cage against the interested course/courses. The date of commencement of the course will be informed to you in due course.

Director – (EE&T), IESL.

Name: .....

Postal Address: .....

Membership No ..... E-Mail: .....

Telephone (Office) ..... (Residence) .....

Mobile: .....

Course	Duration	Course Fee (subject to change)	Pl. mark "X"
Effective Communication	100 hrs every other Tuesdays	Rs.17,500/-	
Speechcraft Programme	10 Tuesdays from 1700 - 1900 hrs	Rs.10,000/- Rs.12,000/-	
Management Development for Engineers - 40th Series	12 Saturdays from 0900- 1600 hrs	Rs.24,000/- Rs.25,000/-	
Safety & Health Management	10 half days	Rs.12,000/- Rs.14,000/-	
Quality Assurance in Welding	05 Saturdays from 0900 - 1600 hrs	Rs.18,000/- Rs.20,000/-	
Accounting for Engineers	02 days from 0900 - 1600 hrs	Rs.7,000/- Rs. 9,000/-	
Highway Engineering	06 Saturdays from 0900-1600 hrs	Rs. 18,000/- Rs. 19,000/-	
Basic Air Conditioning Systems Design	06 Saturdays from 0900-1600 hrs	Rs.17,000/- Rs.19,000/-	
Code of Ethics	One day	Rs.1,000/-	
Bid Evaluation	One day	Rs.4,000/- Rs.5,000/-	
Nanotechnology	One day seminar	Rs.4,000/- Rs.5,000/-	

Signature: .....

Date: .....

## INTERNATIONAL CONFERENCE ON “STRUCTURAL ENGINEERING CONSTRUCTION AND MANAGEMENT 2011” ICSECM 2011

**15<sup>TH</sup> 17<sup>TH</sup> DEC. 2011 AT EARL'S REGENCY, KANDY**

The International conference on Structural Engineering construction and management will be held at Earl's Regency Hotel, Kandy, Sri Lanka. The conference will run over three days and features presentations by authors of all accepted papers, as well as keynote lectures. General and plenary sessions will be accompanied by workshops and technical sessions. Accepted papers will be published in special volume of the conference proceeding with international standard book number (ISBN). For any further information please visit the conference web site, [www.icsem.com](http://www.icsem.com)

### THEMES OF CONFERENCE

The conference will cover the following areas:

- Analytical and Design Methods
- Bridge Engineering
- Composite Material/Structures
- Computational Mechanics
- Concrete Technology
- Construction Management
- Earthquake Engineering
- Experimental Methods
- Fire Resistance Design
- Forensic Engineering and Case Studies
- Innovations in Structural Design
- Maintenance, Repairs and Rehabilitation
- Nanoscale Mechanics
- New Construction Materials
- Nonlinear Structures
- Optimal Design of Structures
- Plates and Shells, Safety and Reliability
- Soil Structure Interaction
- Standards and Codes of Practice
- Steel Technology
- Structural and Soil Mechanics
- Structural Dynamics, Structural Stability
- Structural Health Monitoring
- Sustainable Buildings
- Tall Buildings, Wind Engineering
- Artificial Neural Network
- Retrofitting

### PAPERS

There are around 200 abstract has been submitted. Prospective authors are invited to submit a concise abstract (300 words maximum) that clearly describe the content of the proposed paper. A complete abstract should include the paper title, author's name, affiliation, address, phone numbers, fax numbers, and E-mail address. For further details please refer the conference email and website:

**icsecm2011@gmail.com**  
**www.icsecm.com**

**Full paper submission 15<sup>th</sup> Aug, 2011**

**Notification of acceptance full paper 30<sup>th</sup> Sep, 2011**

**Camera ready paper deadline 31<sup>st</sup> Oct, 2011**

**Early bird registration 31<sup>st</sup> Oct, 2011**

### FURTHER DETAILS

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Or Mr. Amal Peiris,  
TEL: +94714436367, E-mail: [amalpdn@yahoo.com](mailto:amalpdn@yahoo.com)

### REGISTRATION FEES

Local Participants Rs 15,000/=

### KEYNOTE SPEAKERS

Prof. M.P Ranaweera	Sri Lanka
Prof. Hiroshi Mutsuyoshi	Japan
Prof. Naveed Anwar	Thailand
Prof. Samuel Ariyaratnam	USA
Prof. Nelson Lam	Australia
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Prof. Raimondo Betti	USA
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### CONFERENCE CHAIRS

**Prof. Ranjith Dissanayake**  
University of Peradeniya, Sri Lanka

**Prof. M.T.R Jayasinghe**  
University of Moratuwa, Sri Lanka

**Prof. P.A. Mendis**  
University of Melbourne, Australia

**Eng. Shiromal Fernando**  
Society of Structural Engineers, Sri Lanka

## Sri Lankan Banking Sector Successfully Completes the First Cyber Security Drill



Information security specialists watching the Internet for latest trends report the acceleration of cyber attacks carried out through fake web sites and forged emails on the banking and financial sector, which accounts for many millions in losses to both banks and their customers. The opportunity costs to the due to these attacks on the banking industry might be

even greater as widely reported attacks and the devastations left in their aftermath leave both banks and customers fearful of integrating and embracing technology that can clearly deliver cost savings and greater customer satisfaction.

As financial and technology confidence losses mount due to various IT frauds, especially phishing attacks targeted at e-banking customers, it has

and Engineering of the University of Moratuwa in collaboration with the Institution of Engineers Sri Lanka and TechCERT conducted a cyber security drill exclusively for Sri Lankan banking industry.

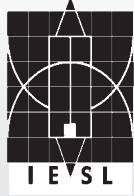
The cyber security drill, conducted on 12th May 2011, spanned a period of two and a half hours with the participation of seven major

banks in Sri Lanka. The threat scenario was based on an advanced phishing attack with the attackers using multiple hosting locations. A team of engineers from TechCERT specializing in cyber security trained an 18-member cyber security drill team on the planning, logistics and operations of conducting cyber attacks and defenses while spearheaded the Exercise Control (EXCON) operations, which provided a central point of observation and coordination for the cyber security drill.

During the exercise the IT security specialists along with the higher management of the participating banks untangled the scenario-based attacks towards a virtual bank. The cyber security drill team units, co-located with

participating bank information systems staff, provided technical expertise on site to the banking staff and helped them improve their computer incident response actions.

The drill was observed at the EXCON by representatives from the Department of Computer Science and Engineering of the University of Moratuwa, Institution of Engineers Sri Lanka and a senior official from a financial sector technology provider. The cyber security exercise was declared a success with participating banks completing the incident response and defensive action tasks prepared by drill team. It is expected that this successful cyber security exercise would contribute to the further improvement of the overall incident handling and management processes and better prepare the Sri Lankan banking industry to face emerging Internet based threats in their drive towards deploying e-banking services.



# Engineering Excellence Awards 2011

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- Four (04) Awards of Eminence for Fellows
- Eight (08) Awards of Excellence for Fellows
- One (01) Engineering Entrepreneur Award for Fellows / Members
- Seven (07) Young Chartered Engineer Awards for members below 35 years of age
- Seven (07) Chartered Engineer Awards for members above 35 years of age
- One (01) Community and Environment Award for Fellows/ Members/ Associate Members
- One (1) Engineering Heritage Award for Fellows/ Members/ Associate Members
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For details please contact the IESL Secretariat at  
 120/15, Wijerama Mawatha, Colombo 7  
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Nominations/Applications with the name of the award marked at the top left hand corner of the envelope should be sent under sealed cover to

The Executive Secretary  
 The Institution of Engineers, Sri Lanka  
 120/15, Wijerama Mawatha  
 Colombo 7.

**CLOSING DATE FOR NOMINATIONS/APPLICATIONS HAS BEEN EXTENDED UP TO JUNE 30, 2011.**

## හෙළ ඉංජිනේරු විස්කම් වෙහෙරගල ජලාශය

### හැඳුන හැටි -2

දකුණු පලාත් ඉංජිනේරු සංගමයේ මාසික සඟරාව වන “ENGINEER” පුවත් පතේ උපුටා ගන්නා ලදී

වෙහෙරගල ජලාශය ඉදි කිරීමේ වැදගත්කම කෙබඳුද යන්න අපගේ පසුගිය ලිපි පෙල කියවීමෙන් ඔබ හොඳින් වටහා ගෙන ඇතුළුවා සැකයක් නැත.

මෙම ජලාශය ඉදිකරනු ලබන්නේ වෙහෙරගල නමැති ස්ථානයේ බවත් එය යාල වනෝද්‍යානය තුළ පිහිටා ඇති බවත් ඔබ දැන් දනී. ජලාශය ඉදිකිරීමේ මූලික කටයුතු සඳහා ප්‍රධාන පිවිසුම් දෙකක් ඔස්සේ වනය තුළට ඇතුළුවීම සිදුවිය. ජලාශය ඉදිකරන වැඩ බිමට කතරගම මුත්තල මාර්ගයේ ගල්ගේ ස්ථානයේ සිට කිලෝ මීටර් 5 ක් වූ අතර ඇල මාර්ගය ඉදිකිරීම සඳහා තණමල්විල වැල්ලව්‍යාය මාර්ගයේ කිතුල්කොටේ ස්ථානයේ සිට කිලෝ මීටර් 22 ක් වනය තුළටත් යා යුතු විය. අල, දිවි වලසුන් හා සර්පයින් ඝහන වන බිමක එය ඉතා දුෂ්කර කාර්යයක් බව අමුතුවෙන් කිවයුතු නොවේ. යාල වනෝද්‍යානය සහිත ඝන කැලෑව තුළ වනයට සිදුවිය හැකි හානිය අවම වන ලෙස කෙටි මාර්ග සකස් කිරීමත් අවම වියදමකින් මාර්ගය ඉදිකිරීමත් අනිවාර්යයෙන්ම සිදු කල යුතු විය.

මේ සඳහා නවීන තාක්ෂණය හා දැනුම යොදා ගන්නා ලදී. එහිදී භූමි පරීක්ෂා වලින් (Site Visit) ලබා ගත් ස්ථාන GPS උපකරණවලට ඇතුළත් කරමින් කෙටි හා අවම හානි සහිත සුදුසු මාර්ග සකස් කර ගැනීමට හැකි විය. කෙසේ වෙතත් වන ජීවී නීති රීතිවලට අනුව මාර්ග කිසිවක් නාර යොදා ස්ථිර මාර්ග බවට පත් කල නොහැක. එබැවින් බොරළු යොදා මාර්ගය සකස් කරන ලදී. මෙහිදී පරිසරයට සිදු වන හානිය හා පරිසර තත්ව වාර්තාවන්ට අනුව ගත යුතු ක්‍රියාමාර්ග නිසි ලෙස අනුගමනය කල යුතු විය. ඒ සඳහා සියලු පරිසර පාර්ශවයන්ගෙන් සමන්විත කමිටුවක් පත්කර තිබුණි. එම කමිටු සෑම තුන් මසකට වරක්ම වැඩබිම පරීක්ෂා කර බලා වාර්තා කිරීමට කටයුතු යොදා තිබුණි. මධ්‍යම පරිසර අධිකාරිය, වන ජීවී දෙපාර්තමේන්තුව, වාරිමාර්ග දෙපාර්තමේන්තුව හා අනෙකුත් ප්‍රදේශයේ රාජ්‍ය ආයතන සම්බන්ධ වී මෙම කටයුතු කරන ලදී. පරිසර නීති අතර දිවා කාලය තුළ පමණක් වැඩ කිරීම, ස්ථිර ගොඩනැගිලි ඉදි නොකිරීම, රාත්‍රි කාලයේ විදුලි පහන් දැල්වීමෙන් වැලකීම, අධික ශබ්දයෙන් හා දුමින් යුතු යන්ත්‍ර සූත්‍ර භාවිතයෙන් වැලකීම, යන සීමාවලට යටත්ව සියළු ඉදිකිරීම් කටයුතු කල යුතු විය.

මාර්ගය සකස් කරමින් වනය තුළට පිවිසීම ඉමහත් අභියෝගයක් විය. සැලසුම් අනුව ඉදිකිරීම් කටයුතු ආරම්භ කිරීම සඳහා පලමුව කලයුතු වූයේ වනය එලි පෙහෙලි කිරීමයි. මේ සඳහා වාරිමාර්ග දෙපාර්තමේන්තුව සතුව පැවති පැරණි විශාල යන්ත්‍ර කිහිපයක් (ඇතැම් යන්ත්‍ර සූත්‍ර වසර 30 කට වඩා පැරණි ඒවා විය.) අලුත්වැඩියා කර වැඩ ආරම්භ කරන ලදී. හෙක්ටයාර් 150 කට වැඩි භූමි ප්‍රමාණයක් එලි කිරීමට අවශ්‍ය විය. 2006 වසරේ ජනවාරි මස වන විට වනය එලි කිරීම ආරම්භ විය. එම වසරේ පෙබරවාරි මාසයේ සිට ප්‍රධාන ඉදිකිරීම් ආරම්භ කිරීමට සැලසුම් සකස් කෙරිණි.

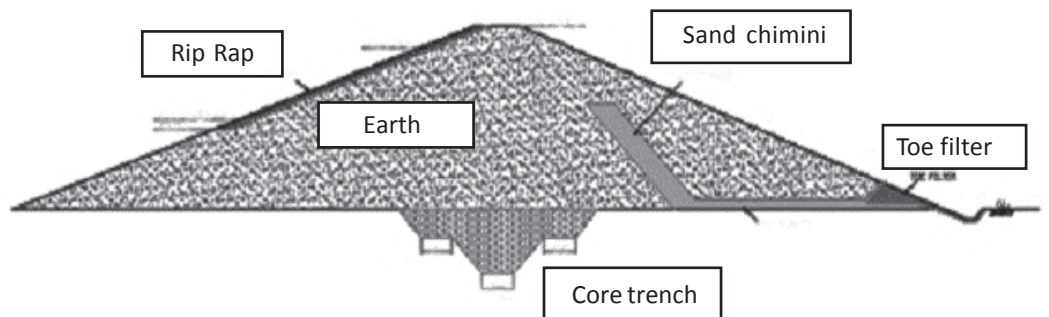
## SEAL FOR CORPORATE MEMBERS

All Corporate Members who wish to obtain the seal, issued by the Institution for this year, are **kindly requested to apply for same on or before October 30, 2011.** The relevant application form could be downloaded from our website at [www.iesl.lk](http://www.iesl.lk). **This seal would be valid only up to 31.03.2012.**

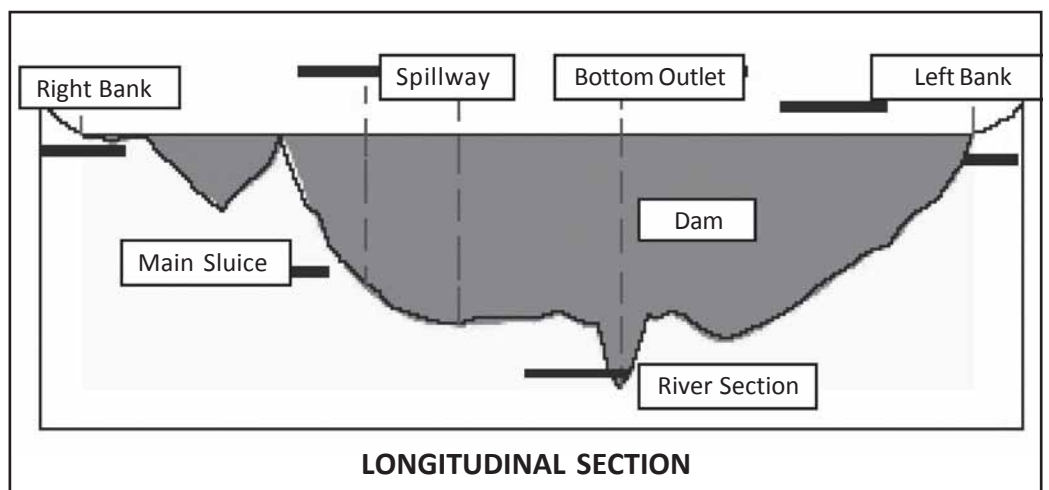
The seal will carry the name and the logo of the Institution, along with the surname and initials of the member as given in the records of the Institution (unless otherwise specially requested by the member), his/her membership number and the validity period.

The application form has to be returned to the Secretariat along with the necessary fees and all subscription fees due, including those of the year 2011.

In case of Structural Engineers, the use of the seal would be a mandatory requirement in certifying documents related to structural engineering work. Members are strongly advised, not to use any other seal, or a duplicate of the seal in their submissions to the local government authorities, as the latter would not consider it as an authentic seal.



වැව් බැම්ම හරස්කඩ



LONGITUDINAL SECTION

9 වැනි පිටුවෙන්.....

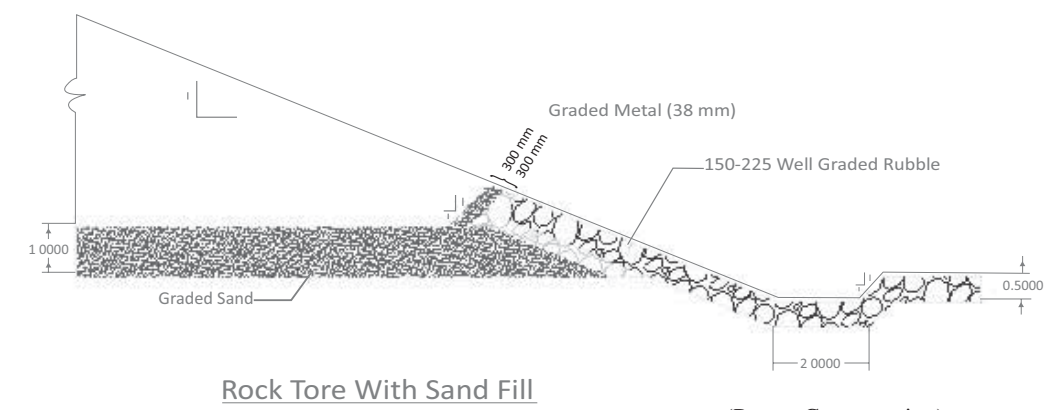
වෙහෙරගල.....

ප්‍රධාන ඉදිකිරීම් කටයුතු අතර වැව් බැම්ම ඉදිකිරීම, පිටවන ඉදිකිරීම, සොරොව්ව ඉදිකිරීම, ඇලමාර්ග හා නිර්මාණයන් (Canal Structures) ඉදිකිරීම, උද්‍යානයකට මාර්ග පද්ධතිය ඉදිකිරීම, උද්‍යාන නඩත්තුව හා පාලන කටයුතු සඳහා අවශ්‍ය ගොඩනැගිලි ඉදි කිරීම, කුඩා වැව් ඉදිකිරීම, තණ බිම් සකස් කිරීම, අලි වැට සංවර්ධනය කිරීම ආදිය වේ.

මෙහිදී ඉදිකිරීම් කටයුතු කඩිනමින් නිම කිරීම ප්‍රධාන අරමුණ විය. එම නිසා වැඩිම කාලය ගතවන ප්‍රධාන ඉදිකිරීම් කිහිපයක් එකවර ආරම්භ කිරීමට කටයුතු කරන ලදී. ප්‍රධාන ඉදිකිරීම් ලෙස වැව් බැම්ම, පිටවන හා සොරොව් දෙකක්, ලුණුගම් වෙහෙර දක්වා වූ කිලෝ මීටර් 22 ක් දිගැති ඇලමාර්ග හා එහි නිර්මාණයන් විය.

වැව් බැම්ම ඉදිකිරීම මෙහි ප්‍රධානතම කාර්යයක් වූ අතර එහි පාදම (Foundation), පස් බැම්ම (Earth Dam) යන කොටස් දෙකක් බැම්මේ ආරක්ෂාවට යොදන වැලි පෙරහන (Sand Filter) හා බිම ගල් යොදා සකස් කරන (Rock Toe) එකක් ඉදිරිපස රළපනාව (Rip Rap)ත් අන්තර්ගත විය. වැව් බැම්මේ හරස්කඩ සැලසුමක් රූපයේ දැක්වේ.

වැව් බැම්මේ පොළව මට්ටමට ඉහලින් වන කොටස මගින් ජලය



Rock Toe With Sand Fill

FIGURE



(Proper Compunction) කල යුතුය. වැලි තැලීමට යොදා ගන්නා කුම වේදය වන්නේ සංතෘප්ත වන තුරු ජලය එකතු කර (Saturated Sand) දෙදුරම් සහිත රෝලර් (Vibrator Roller) යොදා ගනිමින් තැලීමෙනි. වැලි හොඳින් තැලීමෙන් අනතුරුව එහි නිසි ලෙස තැලී ඇත්දැයි පරීක්ෂා කිරීම සඳහා සාම්පල් ලබා ගැනීමෙන් පසුව පරීක්ෂණාගාරයේදී පරීක්ෂා කරනු ලැබේ. මෙසේ අවශ්‍ය උසට වැලි පෙරහන සකස් කර අනතුරුව Rock Toe එකදු ඊට සමාන්තරව සකස් කරනු ලැබේ. Rock Toe ඉදි කිරීම සඳහා යොදා ගනු ලබන්නේ අඟල් 6 (150mm) සිට අඟල් 9 (225mm) දක්වා වූ කළු ගල් හා 1 1/2" ප්‍රමාණයේ ගල් වෙන් වෙන් වශයෙනි. පළමුව යෙදූ වැලි තට්ටුව ආවරණය වන පරිදි 1 1/2" ගල් (Metal) අඩි 1 ක් පමණ ඝනකමට යොදා ඉන් පසුව කලින් සඳහන් කල අඟල් 6-9 ප්‍රමාණයේ කළු ගල් (Rubble) අතුරු ලැබේ. (රූපයේ පරිදි). මෙහිදී කළු ගල් ඇතිරීමේදී විශේෂ සැලකිල්ලක් යොමු කල යුතුය. එනම් කළු ගල් එකිනෙක හොඳින් සිරවන ලෙසින් නිසි ඝනකමට පවත්වා ගැනීමත් ඉතා වැදගත් වේ. මක්නිසාදයත් බැම්ම මගින් ඇති කරනු ලබන තෙරපුම දුරා ගනු ලබන්නේ මෙම Rock Toe එක මගින් බැවිනි. මෙම ගල් ඇතිරීම කාන්තා කම්කරුවන්ද පිරිමින් හා කරට කර සිටිමින් සිදු කිරීම විශේෂත්වයක් විය.

Dam Height(m)	Side Slop	
	Upstream	Downstream
Less than 15	1 : 2.5	1 : 2
15 to 20	1 : 2.75	1 : 2.25
20 to 25	1 : 3	1 : 2.5

රඳවා ගන්නා අතර වැව් බැම්මේ උස මගින් රඳවා ගන්නා ජල ධාරිතාව සැලකීමේදී වැව් බැම්ම ඉදිකිරීම ඉහළම ගුණාත්මක තත්වයකින් කල යුතු විය. බැම්ම මගින් ජලය රඳවා තැබීමේදී ඇති කරන දැඩි ජල පීඩනය මගින් බැම්ම තුලින් හා යටින් පිහිටි පොළවෙන්ද සිදුවිය හැකි කාන්දු වැලකීමට සම්මත ඉදිකිරීම් ප්‍රමිති භාවිතා කල යුතුය. ඒ අනුව වැව් බැම්මේ පාදම සඳහා මධ්‍ය කානුව (Core Trench) නෙවත් බැම්මේ අන්තිවාරම සඳහා (Foundation) අපාරගමය මැටි භාවිතා කෙරේ.

කෙතරම් ඉහළ ගුණාත්මක තත්වයකින් ඉදිකිරීම් කලද වැව් බැම්ම තුලින් සිදුවිය යුතු අපේක්ෂා කරන කාන්දුවීම් මගින් වැව් බැම්මට සිදුවිය හැකි හානිය වැලකීම සඳහා බැම්මේ යටිගං (Down Stream) පැත්තේ වැලි පෙරහන (Sand Filter) හා (Rock Toe) එක ඉදිකරනු ලැබේ. මෙම

පෙරහන පද්ධතිය මගින් ජලය කාන්දුවීම් මගින් සිදුවිය හැකි බැම්මේ බාදනය වලකා ජලය පමණක් යටිගං ප්‍රදේශයට මුදා හරී.

ජලාශය පිරි පවතින විට සුළග මගින් බැම්මේ උඩුගං (Upstream slope) පැත්තේ සිදුවන බාදනය වැලකවීමට රළපනාව (Rip Rap) තනනු ලැබේ. රළපනාව ඉදිකරනු ලබන්නේ විවිධ ප්‍රමාණයේ ගල් කුමටවත් ඇතිරීමෙනි.

ඉදිකිරීම් ක්‍රමයේ පොළවේ පිහිටීම අනුව වැව් බැම්මේ උස තනින් තනනට වෙනස් වේ. මෙම උස මට්ටම් මුහුදු මට්ටමට (Mean Sea Level) සාපේක්ෂව හැඳින්වීම සම්මත ක්‍රමයයි. වෙහෙරගල වැව් බැම්ම ඉදිකරන ලද ක්‍රමයේ පිහිටි උස සැලකීමේදී අවම උස ස්ථානය ලෙස ගඟෙහි (River Bed Elevation) 73 MSL ලෙසත් ගං ඉවුරු (River Banks) 79 m MSL

ලෙසත් ඉන් පසු ක්‍රමයෙන් දෙපසට ගත 98 m MSL දක්වා ක්‍රමයෙන් වැඩි වී යන ලෙසත් පිහිටා ඇත.

බැම්මේ මුදුන් උස 95 m MSL වූ අතර උපරිම ජලය රඳවා ගන්නා උස (Full Supply Level) 92.5 m MSL කි. ඒ අනුව බැම්මේ උස මීටර් 22 කි. වැව් බැම්මේ පාදම සඳහා (Foundation) පිහිටි ගල (Hard Bed Rock) දක්වා පස් ඉවත් කරන ලදී. එහෙත් ඇතැම්විට පිහිටි ගලෙහි ස්වභාවය හා ගුණාංග අනුව (නිසිය හැකි පාරගමය ඉරි තැලීම මගින්) ඒ හරහා ජලය කාන්දුවීම සිදුවිය හැකි බැවින් එය වලක්වා ගැනීම සඳහා ක්‍රියා මාර්ග ගන්නා ලදී. මේ සඳහා තාක්ෂණික ක්‍රමවේදය වන්නේ ගලෙහි එම සිදුරු සහිත ස්වභාවය (Permeability) හෝ ගල් පැලුම් (Cracks) වසා දැමීම (Seal)යි. එනිදී ගල මීටර් 3-5 ත් අතර ප්‍රමාණයක් යන්ත්‍රානුසාරයෙන් සිදුරු කර ඒ තුලින් අධික පීඩනයෙන් සීමෙන්නි ජලය (Cement Grout) මිශ්‍රණයක් පොම්ප කිරීමෙන් සිදුරු හා පැලුම් වැසීමට කටයුතු කරනු ලැබේ. මෙසේ බැම්ම දිගේ මුළුමනින්ම සිදුකිරීමෙන් සීමෙන්නි තිරයක් (Grout Curtain) සකස් වේ. එමගින් පිහිටි ගල හරහා ජලය කාන්දුවීම අවම කල හැක. ඉන් පසුව පාදම් කානුව (Core Trench) මැටි යොදා පුරවනු ලැබේ. මෙහිදී තෝරා ගත් විශේෂිත කිරි මැටි නියමිත ප්‍රමාණයට ජලය යොදා (Optimum Moisture Content) එහි උපරිම ඝනත්වය ලැබෙන තෙක් තලනු ලැබේ.

මෙහිදී ටොන් 10-20 දක්වා වූ ප්‍රමාණයේ තලන යන්ත්‍ර යොදා ගනිමින් පස් තැලීම සිදු කරන ලදී. පාදම් පස් තට්ටුවක සාම්පල් ලබා ගෙන පර්යේෂණාගාර තත්ව යටතේ ද පරීක්ෂා කර බලා ඊලත පස් තට්ටුව දැමීම සිදු කරනු ලැබේ.

ඉදි කිරීමට යෝජිත වූ පස් බැම්මේ පාදම් කානුව (Core Trench) සඳහා මැටි පස් යොදා ගනු ලබනුයේ සාමාන්‍යයෙන් මැටි පස් වලින් ජලය කාන්දු වීමේ හැකියාව ඉතාමත් අඩු බැවිනි. එසේ වුවත් මැටි පස් පොළවෙන් ඉහළට යොදා ගැනීම කල නොහැකිය. ඊට හේතුව මැටි පස් පිටතට නිරාවරණය වන විට ඉරි තැලීම වලට ලක්ව එහි පවතින අපාරගමය හා විය හැකි යාමයි. එම නිසා බැම්ම සඳහා පොළව මට්ටමට ඉහලින් යොදා ගනු ලබනුයේ වැලි මිශ්‍රිත මැටි (Sandy Clay) ය. වැව් බැම්මේ දෙපස හැඩය තීරණය කිරීම මුළුමනින්ම තාක්ෂණික කරුණු පදනම් කර ගනිමින් සිදු කරනු ලැබේ. එනිදී පිහිටි පොළවේ සිට වැව් බැම්මට ඇති උපරිම උසත් ජලය රඳවා ගන්නා උසත් සලකා ගනු ලැබේ. ඒ අනුව බැම්මේ හරස්කඩ නිර්මාණය (Section Design) කරනු ලැබේ. උඩු ගං (Up Stream) හා යටි ගං (Down Stream) බැවුම් වැව් බැම්මේ උස මත රඳා පවතී. මෙම නිර්මාණයන් සිදු කරනු ලබන්නේ බැම්ම හරහා සිදු විය හැකි ජල කාන්දුව අඩු කිරීමට හා බැවුම්වල ස්ථායීතාව (Slope Stability) වැඩි වන පරිදිය.

සාමාන්‍යයෙන් වැව් බැම්මක බැවුම් ප්‍රකාශ කරනු ලබන්නේ ඒකක සිරස් උසකට බැම්ම විහිදී යන තිරස් දුර සැලකිල්ලට ගනිමිනි. උදා හරණයක් ලෙස 1 : 3 ක බැවුමක් පහත පරිදි නිරූපනය කල හැකිය.



වෙහෙරගල බැම්මේ එක් එක් උස පරාසයන් අනුව උඩුගං (UpStream) හා යටිගං (Down Stream) බැවුම් පහත වගුවේ දැක්වේ

පොළව මට්ටමෙන් ඉහළදී බැම්මේ වැලි පෙරහන (Sand Filter) හා (Rock Toe) එක ඉදි කිරීම එකවර සිදු කල යුතුය. වැලි පෙරහන සැකසීමේදී පළමුව වැලි යොදා හොඳින් තැලීම

ප්‍රධාන සාධකයක් වන්නේ ඒ නිසාය. අනෙක් කරුණ වන්නේ මේ සා විශාල පස් ප්‍රමාණයක් ලබා ගැනීමේදී සිදුවන පරිසර හානියයි. මෙම පරිසර හානිය අවම කිරීමට ගන්නා ලද ක්‍රියා මාර්ගය වූයේ ජලාශය ඉදි කිරීමෙන් පසුව ජලයට යටවන ප්‍රදේශයෙන් අවශ්‍ය වූ පස් ලබා ගැනීමයි. අක්කර 3500 ක (1400Ha) භූමි ප්‍රමාණයක් ජලයෙන් යටවන බවට නිර්ණය කර තිබූ අතර එම ප්‍රදේශය තුල භූමියෙන් නිසි ගුණාත්මක තත්වයෙන් යුතු පස් පමණක් ලබා ගන්නා ලදී. පස් ප්‍රවාහන වියදම් කිසියම් ප්‍රමාණයකින් වැඩි වුවද පරිසරය ආරක්ෂා කිරීම සඳහා ඇතැම් විට කිලෝ මීටර් 6 ඉක්ම වූ දුරින් පස් ප්‍රවාහනය කිරීම සිදු කරන ලදී. වෙහෙරගල ජලාශයට යට වන ප්‍රදේශය යාල හා ලුණුගම් වෙහෙර උද්‍යාන භූමිය විය. මෙම ප්‍රදේශය වසර සිය ගණනක රක්ෂිතයක් වන බැවින් රූපය ගස් වලින් ඝනකර කලයුතු විය. එබැවින් පසෙහි මුල් හා ශාක කොටස් වැඩි වශයෙන් අන්තර්ගත විය. ඒවා ඉවත් කිරීම සඳහා විශාල මුදලක් හා ශ්‍රමයක් වැය කිරීමට සිදු විය. පස්වලට ජලය යෙදීමල බැම්ම තැලීම ආදී විවිධ කාර්යයන් සඳහා යන්ත්‍ර සිය ගණනකට වඩා යොදා ගැනින.

මතු සම්බන්ධයි

Contd. from page 5...

"LAST Comment .....

I challenge any body who says that I have not solve the puzzle!  
Note – Stories related to tightly wound/loosely wound springs are also could be analysed by my original derivation. The major problem in this puzzle is the derivation of the fundamental dynamic equation of the system.

Puzzle Guru's Comment:

In my opinion, derivation of the so called fundamental dynamic equation of the system as mentioned above by Eng Kapila Peiris is not the major problem as it is a standard approach used even in High School curricula. As clearly mentioned by Calkin, (someone who is considered as an authority on the subject) with reference to slinky type springs, "The theory of the preceding section, including the wave equation (the one Eng Kapila Peiris is referring to) does not apply, and we must start again" (Reference page 10 of SLEN, April 2011). His equation may be a starting point but not the whole story by any means. This means that the proof is incomplete and I honestly do not believe that Eng Kapila Peiris has solved the extended part of the Puzzle for which a special prize was offered.

*Contd. from page 7...*

### Some Recollections

remember how they said that every year around the months of October-November, they get the monsoonal rains, and they get marooned by the floods for a couple of weeks. As the particular school was located on a hillock, all nearby villagers get assembled there and occupy the school building during that time. They seem to collect all their provisions and food items, store them in anticipation and spend that period, almost annually, during the time Rambukkan Oya floods over its banks and inundates the whole area.

It was a completely isolated and backward area of Sri Lanka, which the British have deliberately neglected without any infrastructure development during their entire period of control from 1818 until 1948, the Independence. As you know, the British took control of the Country in 1815, after capturing Sri Lanka's last King Sri Wickrama Rajasinghe. According to the Kandyan Convention signed between the British and the Chieftains of the Kandyan Kingdom, the British agreed to adhere to certain conditions and fulfil those requirements of the local community. But by 1818, the Chieftains realised that the British were not adhering to the conditions they have signed upon and that the Kandyans have been taken for a ride. In view of this, a rebellion was started from Wellassa-Uva, and the British did not have any control over it. Then after much deliberations, the British decided that Keppetipola Disawe, who was serving them in the Matale area, could be the only person who would bring this situation in Wellassa-Uva to a successful halt. Thus, the British sent in a well armed Brigade to Wellassa under the leadership of Keppetipola Disawe. After reaching there, Keppetipola Disawe enquired from the Chieftains who were rebelling against the British, why they were doing so. In their discussions, he realised that the British were

completely wrong and he then joined the rebels. He sent the arms and the British Brigade back to Colombo through his deputy. The British were really in trouble, and they had to resort to various tactics to capture Keppetipola Disawe and the other rebellion leaders, to finally bring the situation under control. One major tactic used, was to demolish all the reservoirs and village tanks that were found in Uva area.

Sri Lanka from the earlier days had a set up called 'one tank-one village ecology' where every village had a tank. The tank was situated upstream so that the paddy cultivation downstream could be operated and managed by the waters that were collected by the tank. This system had successfully been in operation for very many centuries in Sri Lanka, and there had been thousands of such village tanks around the country. So much so, even now if we take an 'one mile to an inch' Topo Sheet of Sri Lanka, one could see the remnants of such multitude of tanks. The British saw to it that they systematically destruct and demolish these village tanks in the Uva area. The name 'Wellassa' stands for 'one lakh of paddy lots' in Sinhala, that had existed in the area during that time. Once the upstream tanks were demolished, there was no way of continuing the paddy cultivations downstream. The villagers could not live there any longer and they started moving out to other areas and the rebel was brought to a halt, leaving behind a completely barren land mass in Uva. But the British were so angry with Uva that they ignored the whole area completely and did not want to do any development work there. Only during Sirimavo Bandaranaike's period, from 1970-77, the then Minister of Irrigation, Maithripala Senanayake started the Lower Uva Development Programme, and it came on to me to start the planning of the Project in 1973.

I really worked with devotion, and commitment, as I felt that this was very much needed for the area. I had very good guidance from my boss, late Mr. Olsen Gunawardane, who was the Divisional Irrigation Engineer (Planning) at that time. I must mention here, that Mr. Olsen was a very patriotic, extremely honest Engineer who had a long term vision of how to develop the country in Irrigation. He was an 'Under-Study' of Mr. H. De S. Manamperi, a former Director of Irrigation and the First Chairman of Mahaweli Development Board. In the Blueprint for development of Rambukkan Oya at that time, we were planning for 6000 Acres of irrigation development. Now they have considered the domestic water supply to the area as well, in addition to irrigation. I carried out the economic evaluations for different possible alternatives and prepared the Feasibility Report. The Structural Design that I had to submit for the M.I.C.E (London) Examination was also a Radial Gated Spillway for Rambukkan Oya Reservoir.

At that time, the Deputy Minister for Irrigation and Member of Parliament for Ampare, Senerath Somaratne was very keen to take up the project, but he was not successful enough to get it pushed through the Treasury, however. My other project, Muthukandiya Reservoir Project in Bibile Electorate came through, and it was constructed and completed by the Irrigation Department in early 1980's and it became a reality. The Member of Parliament for Bibile at that time, Jayawardane Attanayake, who was the Basnayake Nilame of Kataragama Devale, managed to get the project approved and the money allocated for it. It was an abandoned Tank built by King Mahasen, and the Irrigation Department restored it by closing the breached section of the Dam, and constructing two sluices, a spillway and the irrigation channel system to irrigate 2000 acres.

With the massive development projects now taking place in Sri Lanka to restore the well being of its inhabitants, I am so happy that Rambukkan Oya is becoming a Reality, at least now.

*Contd. from page 5...*

### Solution of ....

We can apply several methods to verify the accuracy of a formula. The first (easiest) is to apply a dimensional check, and obviously the above formula passes this simple test. The second (sometimes the most difficult) is to check the logical reasoning used. The third (and in this case the easier) method is to apply special conditions and see what results the formula yields.

For example, if we have just a spring, with no attached weights, then it is a special condition and  $M=m=0$ . If we apply this here, we get  $f=(M_s/m_s)g$ . What would be the condition for  $f$  to be zero? It is that  $M_s=0$ . Moreover, since  $m_s=0$  at  $t=0$ ,  $f=(M_s/m_s)g$  would be very high at the start and then decrease to  $g$  at the end. These are behaviors completely different from what we observe in practice.

To make matters worse, even in the general case where  $M$  and  $m$  are non-zero, the author seems to have lost track of what his objective should be. Even when  $m_s$  is negligible  $f=((M_s+M+m)/(m+m_s))g$  becomes a constant. But that is not what the author is supposed to prove. What the author is supposed to prove is that the tail part moves with constant velocity - not with **constant** acceleration.

From this it is clear that the author has somehow lost track of what has to be proven and like a runaway missile fed with wrong target information, had tried to home on a completely different target. The sad thing is that even that different target has been missed altogether, leaving the whole exercise a complete failure.

Even if the readers are tired of going through the whole article, I suggest that they read just the 6<sup>th</sup> paragraph. It starts with "Therefore, it is clear that the upper end moves with an acceleration greater than that of  $g$ ". I should rest my case here. But since my intention is to set a good example to our younger members and not to just win an argument, I will proceed further.

The author says tells us to please remember that the result is based on the assumption that the acceleration of the tail and the affected zone is the same and then goes on to contradict himself by saying "in an abstract theoretical sense this is not so". I fail to understand what the author means by that. The author's explanation raises more questions than answers. Is his assertion valid or not? What is the abstract theoretical sense the author is talking about? Haven't we been dealing with the whole subject in a theoretical sense, if not in an abstract sense? If the Newtonian Mechanics that the author has been using is not theory then what is it? Of course, we understand that one has to make practical approximations in the analysis of engineering problems, but these should be stated precisely. Or is the author thinking of relativistic or quantum effects, which are not part of the repertoire of Newtonian Mechanics? Perhaps the author can enlighten us on that.

To be continued.....

### Puzzle Guru Sarath Chandrasiri

*Contd. from page 4...*

### A Spaceport.....

rarefied atmospheric effects and gravitational anomalies of the earth itself. Although it is not an ideal inertial frame, it is much more close to one than Eng Kapila Peiris's Flat Earth model because it is unaffected by the rotation, precession and nutation of the earth.

**Interplanetary Trajectories:** Once a spacecraft is put in to orbit around the earth, further firing of rockets can take it gradually away from the gravitational influence of earth if the so called 'Earth Escape Velocity' is achieved. Once this happens, we have to consider it in a frame of reference centered at the Sun but with the axes fixed in direction with respect to the distant stars.

You may got to <http://www.jpl.nasa.gov/basics> for a simplified manual on the basic theory of space flight.

*Eng Sarath Chandrasiri*

*Contd. from page 2...* **Eng. (Brig.) Kurukulasuriyage Dewapriya Asoka Perera.....**

Eng. (Brig) Perera did his three year degree course in Pune, India through a scholarship he received and has also followed a three months' course on Engineer Officers' Works Management also in Pune India through another scholarship he was awarded. He has attended several seminars and conferences organized locally. Presently he is a resource-person in the Centre for Housing, Planning and Building and has published several publications on Contract Administration and matters relating to financial regulations.

He served the Council as a Representing Member during the Sessions 2006/2007, 2007/2008, 2008/2009 and 2009/2010. He has been a member of the Civil Engineering Sectional Committee and the Development and Professional Affairs Committee.

**THE INSTITUTION OF ENGINEERS, SRI LANKA  
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**Young Members' Technical Conference**

**Call for Papers**

Technical conference of Young Members of the Institution of Engineers, Sri Lanka will be held from 21 to 29 October, 2011 during its Annual sessions.

This conference would provide an opportunity for all young members of the institution a forum to present their technical papers and discuss engineering related topics with industry professionals. It is also aimed at promoting interaction among the young members of the profession and providing a platform to broad base their knowledge on specific subject matters.

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Young Members who are interested in submitting papers are requested to send an abstract (of about 250 words) of the paper they intend to present at the session, to the Deputy Executive Secretary (Education) of the Institution, by e-mail: to [ed@sltnet.lk](mailto:ed@sltnet.lk) (in MS Word or PDF format), with subject titled 'Annual Sessions-YMS', or by postal mail: to Deputy Executive Secretary (Education), The Institution of Engineers, Sri Lanka, 120/15, Wijerama Mawatha, Colombo 07., to reach her on or before June 30, 2011. Authors of Selected papers based on the abstracts, will be given an opportunity to present their papers during the Annual Session.

**Key Dates :**  
Closing date for submission of abstracts: 30 June 2011  
Notification of acceptance of papers: 15 Aug 2011  
Closing date for submission of full papers: 15 September 2011  
Date of the Conference: 28 October 2011

For further information, please contact:  
Deputy Executive Secretary (Education)  
The Institution of Engineers, Sri Lanka  
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