Issue **05** - November - 2019

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CONTENT

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4 -1/2, Bambalapitiya Drive
Colombo 4.
Tel : 011 2508139
Fax : 011 2508139
Email: constructiontodaysl@gmail.com
Web: www.srilankaconstructiontoday.com

Board of Advisors
Prof. Chitra Weddikkara
Dr. Rohan Karunaratne
Eng. Saliya Kaluarachchi
Dr. Yasangika Sandanayake
Eng. Sagara Gunawardana
Mr. Kalana Alwis

Managing Editor
Chandrapala Liyanage

Writers
Subashini Samaranayake
Shanika Gamage

CIOB Coordination
Malathi Piyasena

Designer
Thilak Dunusinghe
(Professional One)

Printer
Imashi Prakashana
96 A, Wanatha Road,
Gangodawila, Nugegoda.

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Editor's Note

We are pleased to present you the fifth volume of the 'Sri Lanka Construction Today' with an array of interesting and informative articles on the construction sector. Through the magazine, we have discussed ways and means to resolve issues in the sector while providing an in-depth knowledge. The gamut of writings has covered the industry in Sri Lanka as well as global phenomenon. Construction industry occupies a significant place in Sri Lanka's economy being the fourth highest sector after services, manufacturing and agriculture.

The annual World Construction Symposium jointly organized by the Ceylon Institute of Builders (CIOB) and the Building Economic and Management Research Unit (BEMRU) of the Department of Building Economics of the University of Moratuwa has become an important event in the construction calendar. The Symposium provides a platform to share insights, experience and technical know-how and discuss remedial actions to resolve issues in the industry among various experts who have gather in this beautiful island from different corners of the world. Our parameters cover decision makers, major contractors, engineers, designers, equipment manufacturers and suppliers of construction material and building products as well as public and private project owners and regulators, working in all segments of the industry who always seek new technology and upgrade the knowledge.

Similar to any other country, Sri Lanka too has to tackle many issues and challenges which are unique to this specific industry. The fluctuating construction workload, unfair and unequal competition by foreign contractors, skills drain and shortages and high cost of developing skills were the main identified problems. The growing demand for sustainability is also one of the main impediments the industry is facing right now.

Sri Lanka is hesitant about going beyond traditional construction boundaries, and the situation has critically deterred the progress of all sectors including financial management, technology and project management. In order to overcome this situation relevant authorities should adopt stringent supervision, and uplift the industries with the collaboration of various stakeholders in the industry. In addition, it is also imperative to apply modern technology to alleviate problems related to raw material.

Furthermore, local contractors should be given an opportunity to collaborate with international firms when implementing foreign funded mega projects. Government's intervention is critical in such instances, which would help local contractors to enhance their knowledge, capabilities and skills.

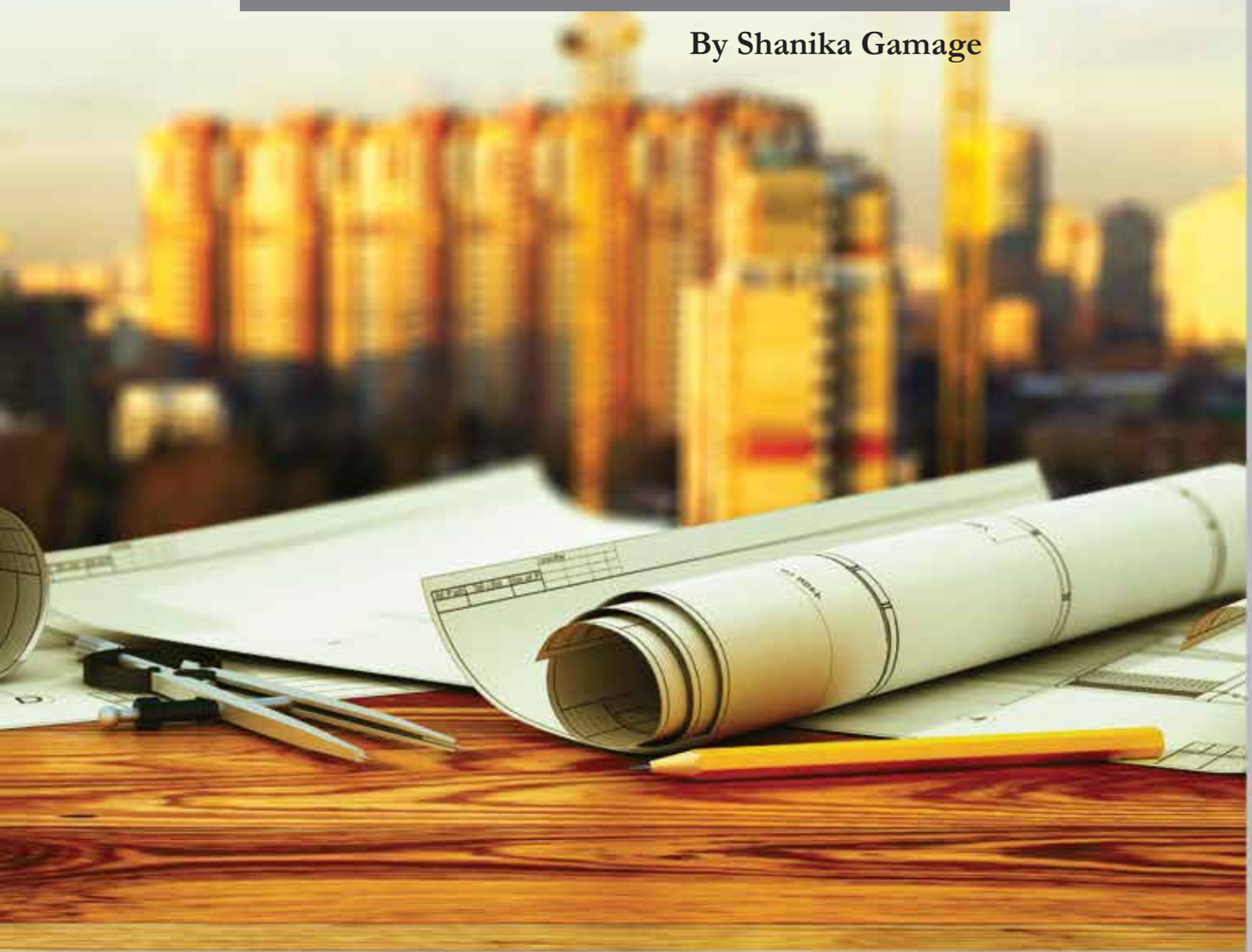
It is identified that the construction industry has been experiencing lot of difficulties due to the lack of government policies or ineffective policies to support the construction industry. For instance, government tender procedures based on low price-based are sometimes shown very inefficient. Political instability of the country created rapid changes of certain policy decisions taken by the previous governments. Since the political instability of the government can affect the construction industry and its productivity, the government of Sri Lanka should consider that there is a need for clear and effective policies for the construction sector. These policies should be developed by identifying objectives of national construction priorities and for providing guidance for the mobilization of investment. Further, such policies are able to provide a framework for enabling and facilitating the development of the domestic construction sector through professional development, business enterprise and productivity enhancement. However, corruption and favourism is one of the main drawbacks created with the open economic policies in many countries.

This is only the tip of the iceberg. At least these findings should create a momentum to all who are in the construction industry to look back on their existing practices and performance.

This is your magazine and your ideas to fill it with innovative and creative thinking are always welcomed. 'Sri Lanka Construction Today' is the ideal platform for your constructive thoughts.

Researched reasons and solutions for labour issues in construction industry

By Shanika Gamage



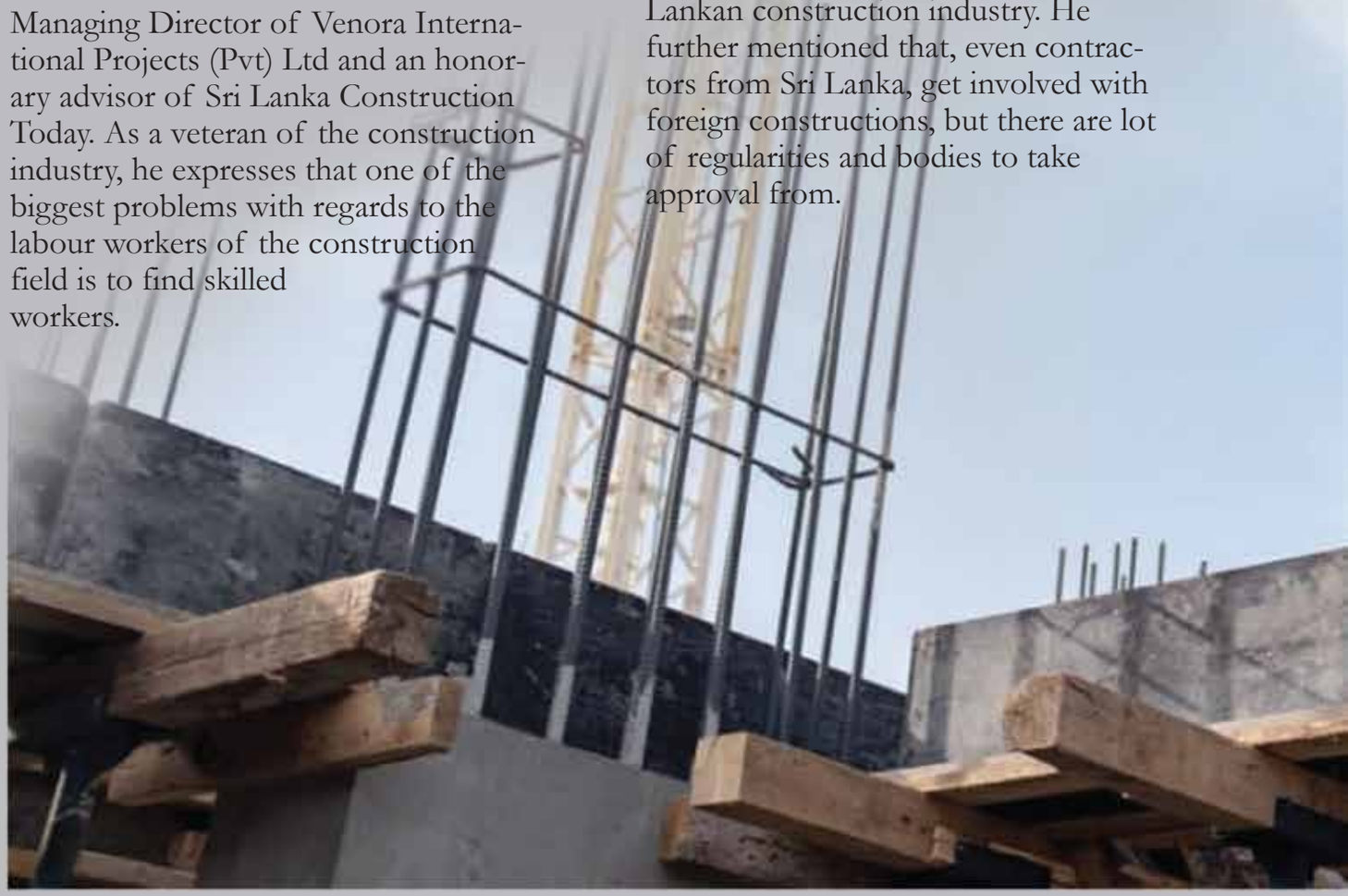
"If everyone is moving forward together, then success takes care of itself "– Henry Ford

Post war Sri Lanka is a hub of developments. There are so many infra structure projects and billions of dollars' worth of investments. Its every construction firms dream come true. But while talking to few leaders of the construction industry, we managed to find out that so many constructers in Sri Lanka has grievances with regards to their labour work force. We at Sri Lanka Construction Today decided to look deep in to this issue. We met constructors, employees, labourers and other third parties in Colombo to get a complete idea about why and how. Because of this research, we managed to find main culprit issues and also to bring out few practical solutions to the problems.

One of the first leader of the field we were able to contact was Eng. Sagara Gunawardana. He is the Chairman and Managing Director of Venora International Projects (Pvt) Ltd and an honorary advisor of Sri Lanka Construction Today. As a veteran of the construction industry, he expresses that one of the biggest problems with regards to the labour workers of the construction field is to find skilled workers.

He said the main reason for this is that there are no new blood coming in to the field. During the thirty-year war, all capable hands joined the army. Now post war, all youngsters want to buy three-wheelers and become three-wheel drivers, which is a very respected occupation. But we have more than 1.5 Million three-wheel drivers currently in Sri Lanka, what we need Mason technicians, Carpenters, Plumbing technicians. But no one likes to learn these. Even the few skilled workers are migrating to foreign countries for a higher pay.

Also, he mentioned that foreign contractors getting involved in the Sri Lankan construction field has become a huge issue, mainly the Chinese and the Indians. Because, the government do not have proper procedures in place and there is no monitoring mechanism to control the level of involvement of the foreign contractors in the Sri Lankan construction industry. He further mentioned that, even contractors from Sri Lanka, get involved with foreign constructions, but there are lot of regularities and bodies to take approval from.



As per the researchers we did, the whys and the how's are below.

The whys & hows!!!!

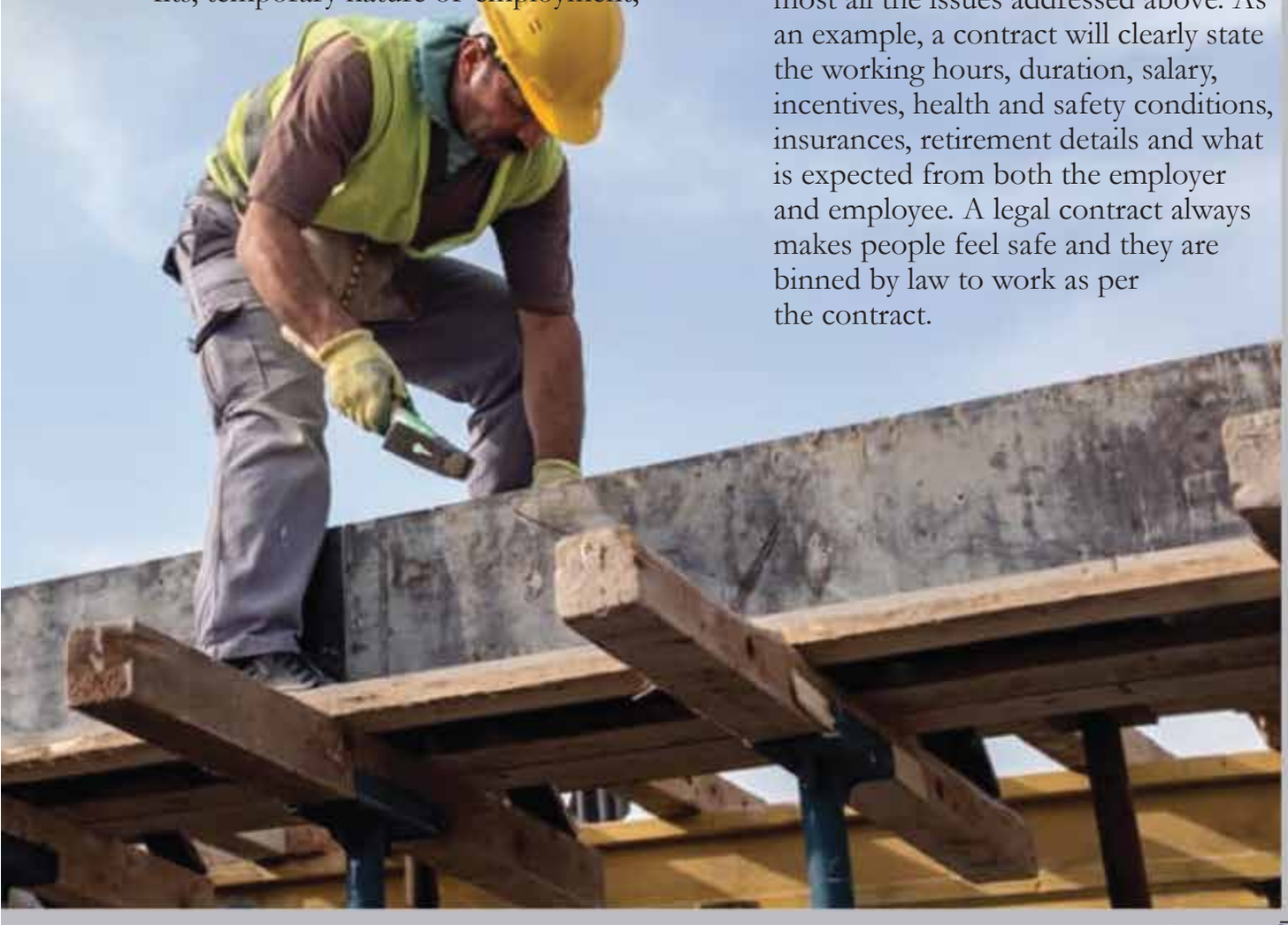
The main four culprits who binds all other problems together are as below,

1. Low Productivity
2. High Labour Turnover
3. Poor Safety
4. Insufficient Quality of work

After further interviews with both the employers and employees we were able to recognize some reasons as to why these issues come to exist. While it is impossible to make one person 100% satisfied or to completely address one certain issue, it is all about negotiations and compromising and doing the right thing. Here are looking in to some of them.

Lack of a proper contract between both the parties, poor retirement benefits, temporary nature of employment, lack of communication with families, poor incentive scheme, lack of social recognition, insufficient income, being away from family and relatives, non-availability of recreational facilities, political and social influences, interpersonal relationships, behaviour of the immediate supervisor, lack of safety and sanitary facilities and influences from the dependents are some of the issues both the parties agreed on.

Both the employers and employees agreed that having a proper contract in place has always been very helpful for both the parties. Most of the well-established construction firms in Sri Lanka has this in practice. Contract is the foundation in employment relations, which establishes inducement and contribution vital to relationship in an organization. It is also defining all most all the issues addressed above. As an example, a contract will clearly state the working hours, duration, salary, incentives, health and safety conditions, insurances, retirement details and what is expected from both the employer and employee. A legal contract always makes people feel safe and they are binned by law to work as per the contract.



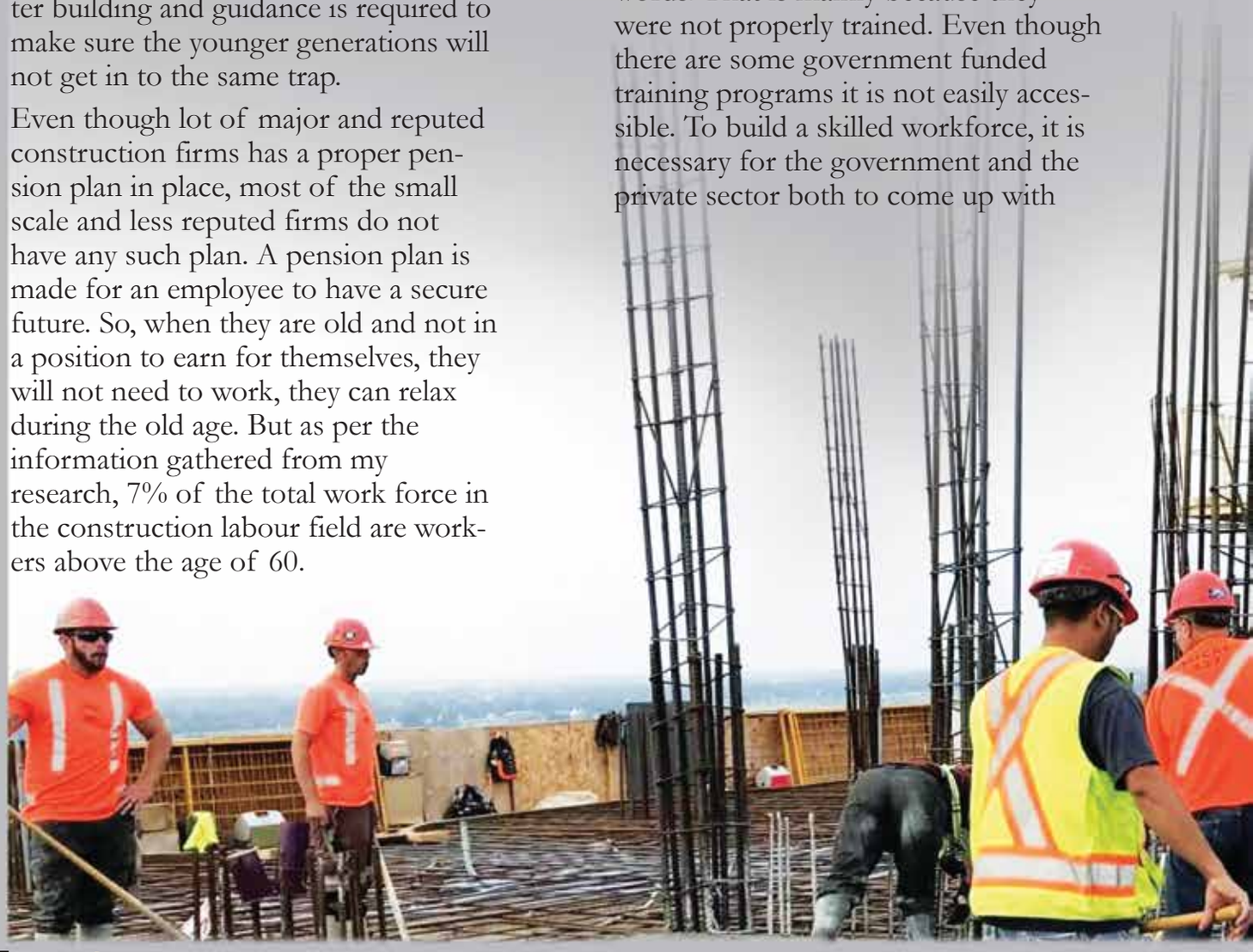
Money is very important factor to achieve a comfortable life. Therefor every human tries to get more than they can earn. Due to this reason no one is satisfied when it comes to their salaries, because needs are unlimited but the resources are very limited. During our interviews with construction firm owners and employees it was evident that, most of the times construction labours earn more than the people who are doing a white-collar job. This was confirmed by a report issued by the central bank of Sri Lanka. It is evident that the management of that money is poor. Due to various bad habits, like being addicted to alcohol, cigarettes, betting and etc, they waste a lot of money. These are personal changes that needs to happen within and from the young age proper character building and guidance is required to make sure the younger generations will not get in to the same trap.

Even though lot of major and reputed construction firms has a proper pension plan in place, most of the small scale and less reputed firms do not have any such plan. A pension plan is made for an employee to have a secure future. So, when they are old and not in a position to earn for themselves, they will not need to work, they can relax during the old age. But as per the information gathered from my research, 7% of the total work force in the construction labour field are workers above the age of 60.

They have to keep coming to work or look for work because they do not have a proper pension plan and any intelligent youngster will not walk in to the same work field as their fathers knowing these loopholes.

Further research showed us one other interesting fact for elder workers to be in the work field, that is also because there is a huge lack of skilled workers. As a favour to their employers and due to the loyalty, they have for them, they continue to come to work. It is evident that these all interconnected and we need to breakthrough one to break all.

Lack of theoretical knowledge is also one factor for them to be unskilled workers. Most of the labourers confessed that it is very difficult for them to understand technical drawings and words. That is mainly because they were not properly trained. Even though there are some government funded training programs it is not easily accessible. To build a skilled workforce, it is necessary for the government and the private sector both to come up with



good training programs both in theories and practical and paid internships needs to be offered for hands on training.

All construction works are done in projects wise, and they are always aimed to finish in a short period of time, it's very difficult to find projects which will continue for years. We all want consistent in our jobs. But in this field, it's a rare thing to find. Work can be stopped at any time due to various reasons, suspension from work and getting redundant is every construction labourers' nightmare. Under these circumstances it is very difficult for us to think that the young generation will choose to set foot in this industry.

All work is hard work, but with regards to construction industry it is harder than any other work. Construction workers have to do very heavy works. Sometimes they have to carry high weighted things which are not suitable for any person. As well as most of the times they have to work under difficult environmental conditions. These are also few reasons why people don't want to get in to or they walk out of these works. There's nothing much anyone can do because it is the nature of the job that is required to be done. But maybe in a proper training preparing the workforce on these issues, like to address health and safety during work, come up with proper health and safety procedures and to come up with motivation programs such as more pay and incentives and other benefits will make the difference.

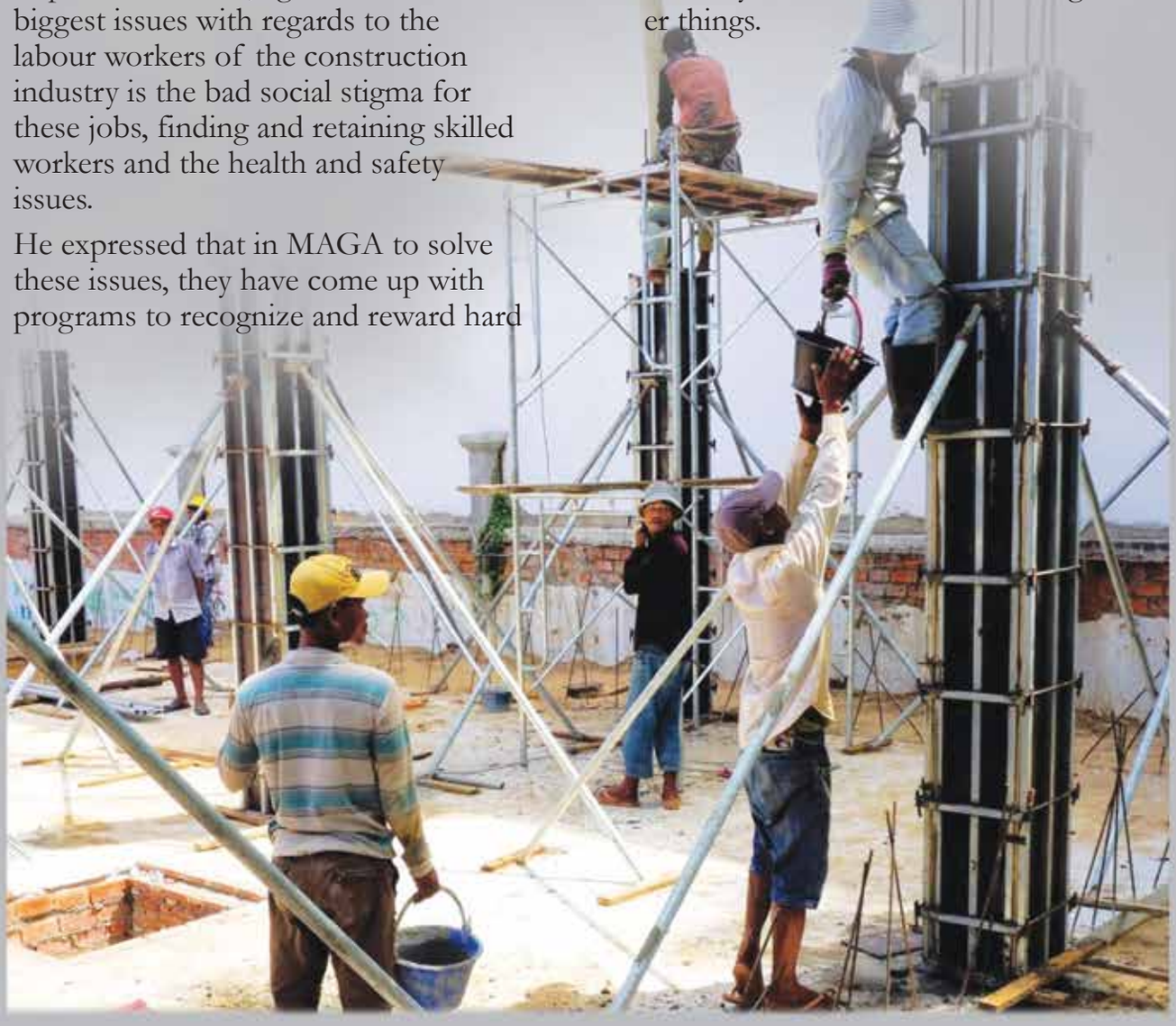
We are social recognition and respect. Specially in a country like Sri Lanka, it is very important to have social recognition for one's job. In other developed countries you are not what you do, it is just another job. The doctor and the labourer will sit together and have a drink. But in Sri Lanka it is very different. Maybe that is why we are still a developing country; it is not about the

infrastructure or other facilities but it is all about one's perception. As an example, I can remember my father also used to tell my brother, that if they didn't do their studies well all he can do is working as a labourer in a construction industry. So, the change needs to come within. We need to educate our younger generation to give the same respect to the janitor and which they will give to the CEO of a company.

My research led me to a great leader of the construction industry. I got the opportunity to discuss these matters with the Chairman and Managing Director of MAGA Engineering (Pvt) Ltd, Deshabandu, Captain M.G.Kularatne, a visionary leader of Sri Lanka's construction industry. When inquired Captain Kularatne, agreed that the biggest issues with regards to the labour workers of the construction industry is the bad social stigma for these jobs, finding and retaining skilled workers and the health and safety issues.

He expressed that in MAGA to solve these issues, they have come up with programs to recognize and reward hard working labour workers and also in MAGA these workers are never recognized as just Masons or labour workers but instead as technicians. He also said that improving working conditions are the best way to retain employees. For MAGA technicians they have separate quarters with nutritious food, comfortable beds with nets, wash rooms, safety wear and proper training. He agrees that it is an extra cost to the company, however he states that an employer has to invest on their employees to gain the profits.

All in all, the future of the construction industry is clear. There are lot of potential projects coming up. With the correct guidance from the government and industry leaders this industry will not only survive but will achieve greater things.



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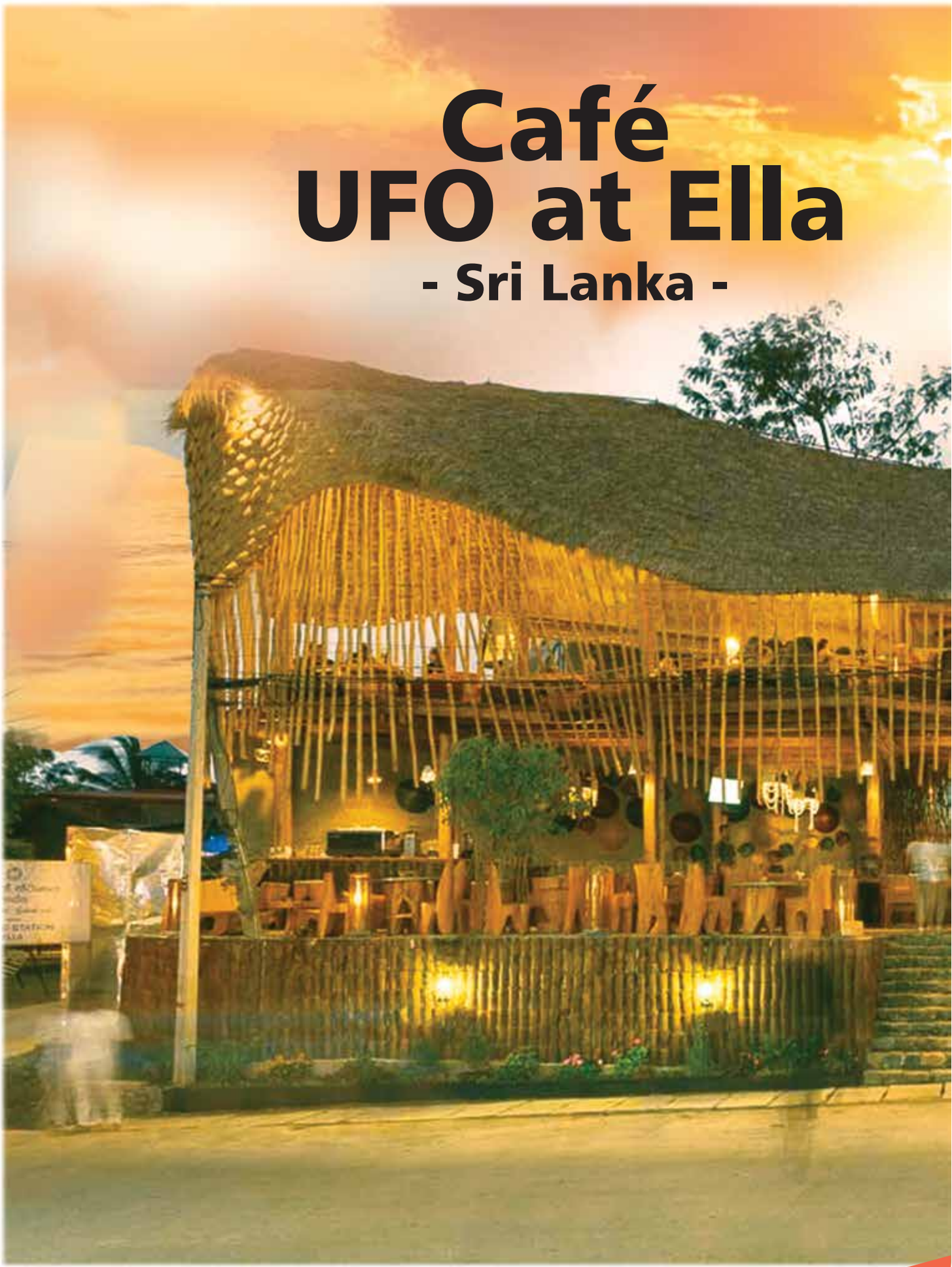

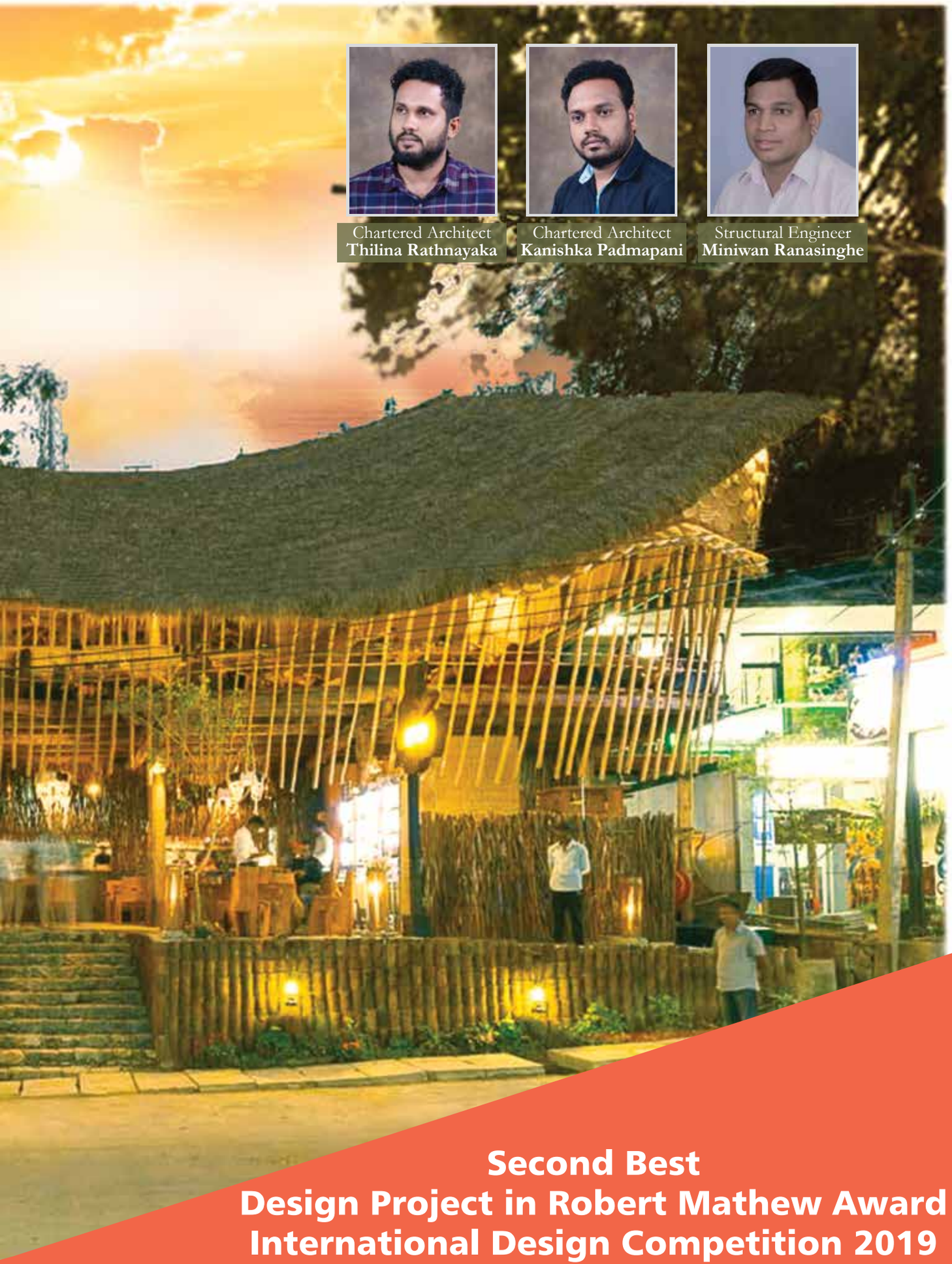

Chartered Architect
Thilina Rathnayaka

Chartered Architect
Kanishka Padmapani

Structural Engineer
Miniwan Ranasinghe

Second Best Design Project in Robert Mathew Award International Design Competition 2019

RAPA Chartered Architects was awarded a certificate of commendation in recognition for the innovative Café UFO design at the Robert Mathew Award international design competition 2019. It was organized by Commonwealth Association of Architects (CAA) in association with Architectural Association of Kenya (AKK). Award ceremony was held at the Sarova Whitesands Beach Resort, Mombasa, Kenya on 14th of August 2019. Café UFO has been selected as the second best design project among the entries of 35 Commonwealth countries.

In 1982 CAA established this award to commemorate its founder Sir Robert Hogg Mathew. The award is to recognize innovative contributions to the development of architecture, especially in the Commonwealth context, by an architect of architectural practice nominated by a Member Organization of the Commonwealth Association of Architects.

About Café UFO Design

The hill country is heavily covered based on the stories of King Rawana. Rawana Ella (waterfall), Rawana Cave and mini Adam's Peak are key tourist destinations in Ella. It is a beautiful town in the hill country of Sri Lanka which is filled with tea estates, mountains, and waterfalls and of course with some good air to breath. Lots of people make Ella as one of their must visit destination just to witness the breathtaking views it creates. It is a dream place for many trekkers with some of the best hikes the Island provides. This hidden village got vastly popular among the tourists lately. From what we understand, it is both celebrating and suffering due to explosive growth that often accompanies such places.

Vernacular character of Ella is rapidly going away due growth of uncontrolled haphazard buildings that are constructed in the area without considering the sense of surrounding. The Design concept inspired from a flying machine which is widely known in Sri Lanka as the "Dandu Monara Yanthraya", or Large Peacock Machine in Sinhala. King Ravana is considered as the first king who flew over the world with his aeroplane, Dandumonaraya.

Mainly timber was used in the construction of the spaces of the restaurant. The structural timber columns acquired are from rose gum tree - Eucalyptis grandis that is grown purposefully and approved for usage by the Forest Department of Sri Lanka. Micro timber branches are used as rafters of the roof and it is thatched with two layers of blady grass - Imperata cylindrica with a tar felt sheet as a waterproof insulation in between. Lots of degraded wooden logs have been acquired for furniture. Especially bar counter stools were made out from vehicle wheels. Interior was designed with the application of eco-friendly and re- claimed materials. Cinnamon sticks and Sri Lankan traditional Reed and rush products were used for some of interior partitioning and wall decorations. Interior and exterior lighting are complemented with reclaimed metal pots, water buckets, round roof tiles and tires.

Café UFO restaurant luckily got the broad frontage to the main road and it gives a dynamic character and outdoor dining experience as well. Café UFO was designed by Architects Thilina Rathnayaka and Kanishka Padmapani (RAPA Chartered Architects) in four months and construction was completed within six months.

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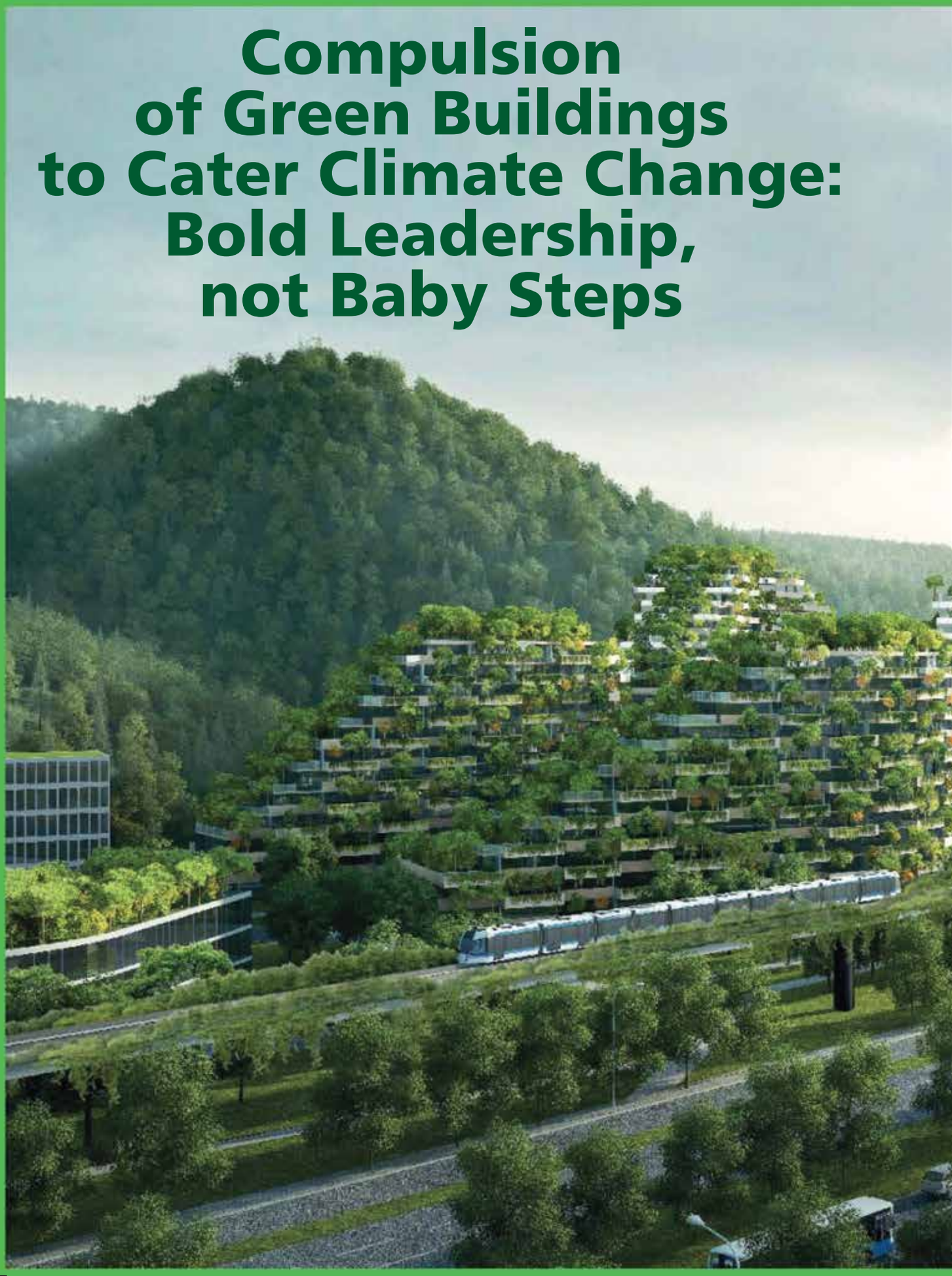
Compulsion of Green Buildings to Cater Climate Change: Bold Leadership, not Baby Steps



Dr Ravihansa Chandratilake
B.Sc. (BE) Hons, B.Sc. (QS) Hons, M.Sc. (Archt),
M.Sc. (Civil Eng), PhD (Civil Eng)

After more than three decades of talk about the potential of building green, we've still failed to change the way we design and construct buildings so that the built environment stops being a dominant contributor to runaway climate change.

The Earth has already warmed about 1°C since the 19th century and it's on track to rise another degree. This second degree would push stable civilization to the very brink. In its recent report, the UN Intergovernmental Panel on Climate Change called for "urgent and unprecedented changes" to reduce greenhouse gas emissions (GHGs) so that we avoid reaching 2°C. While 1°C may sound incremental, the action required to stop it is not.

Urbanists, engineers, architects, designers and developers - the built environment industries - know this. The industry created "green building" more than 30 years ago to

prove that buildings can use less energy, store energy and even generate their own energy on-site. We know it can be done, but it needs policy, regulation and incentives in order for it to become business as usual.

Zero won't happen voluntarily

Buildings are responsible for 40 per cent of energy-related carbon dioxide (CO2) emissions worldwide. The Global Alliance for Buildings and Construction reports that global building sector CO2 emissions are up three per cent since 2010.

Architects have seen buildings as a possible solution to the climate crisis. Rather than being a major contributor to GHG emissions by relying on fossil fuels, buildings could not only greatly reduce their demand for energy, but could generate clean, renewable energy. The built environment must be carbon-neutral by 2050, if we are to limit warming to below 2°C.

To move ideas like this forward, Architecture2030.org, a U.S.-based non-governmental organization, recently introduced the first national and international "Zero Code" building standard for new construction. It focuses on designing buildings with high energy efficiency that use no fossil fuels in their operation. The organization is working in California and China to put the policy into practice.

Although the game plan exists, adoption is slow. Existing moves to reduce GHG emis GHG emissions are voluntary and there is no penalty for falling short on performance. It's hard to call this a plan for transformation.

Settling for mediocrity

In North America, most green buildings are judged by a family of certification systems called LEED (Leadership in Energy and Environmental Design). But LEED's actual impact on GHG emissions is uncertain.

We found only one peer-reviewed study showing that LEED projects reduce GHG emissions. In contrast, dozens of articles conclude LEED is primarily a "public relations tool" that offers the lure of "measurable publicity" and administrative convenience.

The most recent version of LEED (v4) evaluates a new building's energy performance after construction is completed. (Otherwise, the energy performance of a building is evaluated on a predictive model based on the building's design.) This is a move in the right direction: energy performance should be measured in operating buildings.

But there's a catch. For new construction, it's optional. If professors gave students an A at the beginning of the semester, with an option to have their performance evaluated at the end of the semester, how many would stick with the A? What effect would this have on learning?

The performance of LEED-certified buildings (and those that are not yet certified) are evaluated against a proprietary dataset and given an "Arc score." This process anchors our progress to a baseline number, not towards constructing unprecedented sustainable buildings.

This streamlining can leave us to falter in our ambitions. When there are no consequences for failure, we set ourselves up for mediocrity, not progress. If we do not know how LEED buildings contribute to GHG emissions reductions, we cannot expect them to be a solution to the climate emergency.

Bold leadership, not baby steps

Canada has said it will have "net-zero energy-ready" building codes in place by 2030. Here "ready" means that buildings may continue to use fossil fuels, but will be equipped with infrastructure to switch to on-site renewables. British Columbia is already piloting a subsidy program for the construction of 15 to 20 of these buildings.

The approach is comparable to the production of hybrid electric vehicles before plug-in electric vehicles as a more palatable, marketable and incremental path to change. In B.C., where hydroelectricity is abundant, a hybrid vehicle produces 53 times more emissions than a fully electric one.

GHG emissions from our buildings, worldwide, need to be 80 to 90 per cent lower in 2050 than they are today. The incrementalism is understandable, but the numbers do not work out.

We have the capacity to reduce energy-related C02 emissions from buildings to zero - or close to it. But we're still far from being able back up the C40 claim that cities "are taking bold climate action, leading the way towards a healthier and more sustainable future."

Big Oil is now being increasingly being hit with "climate liability lawsuits." If we settle for baby steps in terms of GHG emissions, the built environment industries will be no different.

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NEWS

Panel discussion on 'Way Forward For the Construction Industry Crisis in Sri Lanka'

Ceylon Institute of Builders (CIOB) organized a panel discussion, themed 'Way Forward For the Construction Industry Crisis in Sri Lanka' at the Organization of Professional Association of Sri Lanka (OPA) recently.

The panel comprised industry experts such as Senior Professor of Economics at the University of Colombo, Ranjith Bandara, Eng. Major Ranjith Gunatillake, President, Chamber of Construction Industry Sri Lanka (CCI SL), Ranjan Sibera, Director of Board of Investment (BOI), and Aravinda Perera, Managing Director of Rocell Ceramics Lanka.

CIOB President Dr. Rohan Karunaratne addressing the gathering

From left: Moderator Eng. Mevan Gunathilake, Managing Director of Rocell Ceramics Lanka Aravinda Perera, President of Chamber of Construction Industry Sri Lanka Eng. Major Ranjith Gunatillake, Senior Professor – Economics, University of Colombo Ranjith Bandara and Board of Investment Director Ranjan Sibera.

Participants at the event

In conversation with a true leader of the construction industry

Up close and personal with, Chairman and Managing Director of "MAGA" Deshabandu Captain M.G.Kularatne

By Shanika Gamage

"If your actions inspire others to dream more, learn more, do more and become more, you are a leader" - John Quincy Adams

We all desire to be recognized, respected and appreciated. But these things are earned, not just handed over. Among leading construction companies not only in Sri Lanka but also in South Asia, MAGA Engineering (Pvt) Ltd is one of the most respected and prestige companies. As they say, MAGA is a synonym for quality, speed and care. If you ask even a young student, what is MAGA, they will definitely tell you that it's a construction company. MAGA has become the "Apple" in the Sri Lankan construction industry. The name itself is enough and no introduction is required. Even though he doesn't like to take credit for the outstanding achievements of MAGA, it is very difficult not talk about the driving force and extraordinary leadership behind MAGA. He is none other than the Chairman and the Managing Director, Deshabandu Captain M.G. Kularatne. On a rainy evening among hundreds of other busy meetings, I got the opportunity to meet this enigma at his office in Narahenpita.

Captain Kularatne, is a graduate of University of Ceylon. Joining the Sri Lankan army after graduation, he was elevated to the rank of Captain in 1968. Subsequently, he served as the Administration Officer at the new parliament project at Sri Jayawardanapura for Mitsui Construction of Japan and as the Chief Administration Officer at the Sri Jayewardenepura General Hospital Project for Kajima Corporation of Japan. He also served as the special advisor to Takenaka Komuten Co Ltd of Japan at the New International Passenger Terminal Project at the Katunayake International Airport.

With his incentive knowledge and experiences in working closely in all of the above major construction projects, Captain Kularatne established Maga Engineering in 1984, formulating the strategies of construction management that helped it become a model construction company and steering it to its present market leadership position. A Fellow of the Institute of Certified Professional Managers, and the Institute of Chartered Business Administrators, Kularatne was the winner of the "Entrepreneur of the Year for 2018 at the "Ada Derana Sri Lankan of the Year" Award Ceremony. Kularatne has been one of the past Chairman of the Major & Specialist Constructors of Sri Lanka, the apex body of the country's major construction companies.

The first thing that struck me when I met him was how simple and humble he is, Maybe that is one of the reasons why he was bestowed and honoured with "Deshabandu" and Sri Lankan Entrepreneur of the year for 2018 awards. While talking to him I was able to pick his brain not only about construction and leadership, but also about current political and economic situation in Sri Lanka. It is truly an interview worth reading.

You are a well-known figure in the country, can you tell us something people don't know about you and something to motivate aspiring future leaders of the field.

I am well known because of MAGA, and MAGA is all about team work. We are here today and have made great achievements, all thanks to our team, their hard work, dedication and sacrifices. I can't emphasize that enough. I am taking this opportunity to thank the whole MAGA team from the most junior employee to the most senior and their families.

To all the newcomers and future leaders in the field: I have always said to be disciplined, simple, committed to work in a team, led by example and have faith in yourself. Everything else will fall in to place.

What is your take on the current situation of the construction industry in Sri Lanka?

There is this famous adage that "construction is the barometer of the economy", and

it is true for Sri Lanka as well. Right now, it is an unfavorable time for the construction industry in Sri Lanka. Within the present political and economic backdrop, investors have been reluctant to invest and start new projects. It has also been difficult to continue some projects that are in hand due to delays in payments and the cautious outlook held by financial institutions. All we can do is to survive and weather this period - and wait for better times.

The construction requirements, are they being increased or decreased? The timelines this took place and why? What factors are contributing to it?

The need for construction will never cease, as construction is a key component of any developing economy. The current political climate of the country and underlying macroeconomic conditions has slowed down investment and initiation of new projects. In return, construction industry has seen a drop in its workload. However, the industry is known to cyclic, and it is expected that a turnaround in economic outlook in the near future could at least partially reverse this trend.

Personally, what are the challenges you feel that are faced by MAGA?

The challenges faced by MAGA are similar to those faced by the wider industry mentioned above. However, the experience and resilience of our team in the face of adversity has ensured that we are able weather the storm and await better days.

According to you, who is the biggest competitor for MAGA at the moment and why? How is MAGA planning to overcome them?

The local construction industry has been on an upward journey together and it has been really heartening to witness several construction companies do well in the last decade or so. Presently we all share that journey and success together. However, the increase of foreign contractors in recent times has become a challenge to local contractors, which has been amplified by the lack of proper policies, procedures and controls in place to properly regulate their involvement in the local industry.

In common, what are the challenges faced throughout the industry in Sri Lanka?

As I said earlier, the lack of continuous work in the industry is the primary challenge, which has prevented sufficient income generation and thus sustainable growth. I would say the second challenge is not having enough skilled craftsmen. The increasing number of foreign construction firms has also become an issue, due to the advantages they hold in tax systems, supply chains and labor compared to that of local construction companies.

Is there a manifesto for the construction field? Something like guidelines or principles? If so, what are they? If not is it time to create them? What should be included in this? Who should take responsibility in it? Like charted institute of marketing or accounts, is there a government or non-government body presiding over this industry?

The leading bodies in the industry are the Construction Industry Development Authority (CIDA), National Construction Associations of Sri Lanka (NCASL), Major Constructors of Sri Lanka (MCSL),

Chamber of Construction Industry (CCI) and Ceylon Institute of Builders (CIOB). They all work together for the construction industry to sustain and prosper, and there are written constitutions for all these organizations. However, there is no one charter, guideline or code of conduct for the industry as a whole. In addition to their contribution to the betterment of the construction industry, they always focus on maintaining a regulated and ethical industry.

Are you satisfied with the governments support to the private construction sector?

Without the support from the government, no industry can prosper in a country. We believe the government can do more. In some countries like Maldives, Bangladesh and Malaysia, it is a must for the foreign contractors to get into Joint Ventures with the local contractors. In Sri Lanka, there is no such protection for local construction companies. In the last budget, they have barely mentioned that the local construction industry should be protected and foreign contractors should have joint ventures, but this has not been followed up with the enacting of required regulations. It has not been made mandatory, compelling foreign contractors to have joint ventures with local construction companies, nor have they specified any minimum percentages of work that should be carried out by the local construction companies. Furthermore, once the government has such rules, they must ensure that only reputed CIDAqualified contractors get these opportunities.

According to you, what should be the government's role in the construction industry and what support should they provide for this field to excel?

The government's role should center on its policy or stance with regards to the construction industry. The government should make better polices and give the opportunity to CIDA-qualified contractors to grow and guide the small and medium scale contractors to build themselves up to become reputed contractors. Even if the projects are funded by foreign governments or investors, the government should be able to insist and demand that an opportunity be given to the local contractors to obtain a substantial portion of work and also receive technology transfer and training from the international Construction companies on latest technology.

Sri Lanka is currently in a transition period with regards to politics. How is it affecting the construction industry and as a head of the largest construction organization in the country what is your expectations from the new head of state?

We want the incoming head of state to create a stable government and to develop the country by adopting holistic, consistent and practical economic policies, which in turn can create good living conditions. Social harmony is also of utmost of importance because no country is worth if they are not a united country.

Construction today has been researching about the issues with regards to the human resources of the construction industry, we found out that one of the biggest challenges for the construction field is payments, payments due from the clients and due to third parties and employees, what is your view about this? How should things change?

The government's capacity to borrow, shortage of work and lack of liquidity in the economy has resulted is payments being delayed. If and when political stabili ty comes, everything else will follow, including creating a more attractive investment environment in Sri Lanka, thus driving growth.

All most all the constructions firms complain that it is difficult to fight with international firms such as firms from China and etc., especially because they always quote a lesser amount than the local firms, so how do they do that? And what actions, as a nation we can take to prevent it?

The government has to introduce better regulation that will create more of a level playing field. CIDA has a key role to play here. Projects that are locally financed should be restricted to local construction companies. In foreign financed projects, at least 30 percent of the work should be made available to local companies through joint ventures. Furthermore, income tax

and visa loopholes for international contractors should be reviewed, along with certain barriers placed for entry of cheap foreign labor and materials in to the country. In addition to that, streamlining the tax regime for imported materials would also help reduce construction costs of local companies.

Labor has become one of the other biggest problem for all construction firms equally, finding skilled workers, retaining them, health and safety issue, what is your thought on that and what solutions do you suggest to overcome them?

We definitely lack skilled workers, whilst we lose skilled workers to foreign countries at higher pay because we cannot ensure their continuation of work. This in return has affected the development of the skilled construction workforce: six months they will work in construction whilst the next six months they will work in the paddy fields, and tend to forget their trainings and get demotivated.

I agree that there are lot of health and safety issues. This is mainly because of lack of funds allocated towards same and lack of education on how important the health and safety are. At MAGA, we appreciate our labor workforce and have invested in providing them with good accommodation other amenities.

We are a nation of builders, from around the world visitors come to see our Sigirya, Stupas, tanks, gardens and marvel on them, how they were made without all the technological advancements of today. Today even with all the advancements it's difficult for us to build monuments that will last for a long time, as an example recently a housing complex in Wellawatta area collapsed, what is your take on this?

It is reasonable to talk and be proud of our past. However, due to foreign invasions and various other reasons we have lost some of our techniques and have not been able to retain our capabilities across time. As a nation that can sustain, we must not cry over that but develop new technologies and go forward. If you look to the past of any country, there are great periods of development as well as disasters, an even in technologically advanced countries like the USA buildings have collapsed. In going forward, we must introduce measures in the industry that will ensure quality of work, materials and responsibilities of the workforce are given the right attention.

How do you feel about the green building concept? Is it something that can practically be introduced to Sri Lanka?

It is a very good concept but the capital costs can be high. However, I can remember those days solar power used to be very expensive, but now they have gradually become more affordable. Therefore, with time people will gradually move more towards green building concepts, especially with the realization of the value in saving the environment.

In the same research I mentioned we found out that lot of construction laborers had a grievance that there is no job security and the social respect and recognition for them, so they do not want their children to follow their footsteps in to this field, what is your thought on that? How do we change this stigma?

Yes, there is considerable social stigma, with the use of 'mason bas', 'paippa bas', or 'kulee wada karaya'. We have to also understand that the Sri Lanka was a feudal civilization and still retained some of the characteristics from that age, and we cannot change things within a day but gradually educate our younger generation to respect everyone equally and not based on profession or status. Moreover, construction craftsmanship is indeed a skilled, respectable profession. In MAGA we call them technicians, first it was difficult but now everyone has gotten used to it and the technicians feel respected and valued, which in turn has motivated them to do their best work. To supplement this, we also conduct ELTP (Employment Linked Training Program) in partnership with ADB and Ministry of Vocational Training. It is an on-the-job program and offers them trade certificates that have increased their social acceptance and economic value.

In concluding the interview, Captain Kularatne said and I quote, "Finally, I want to say that we have a very bright future and the present situation is only a temporary setback, and we are all hopeful towards better days to come - and to work together to build our nation"

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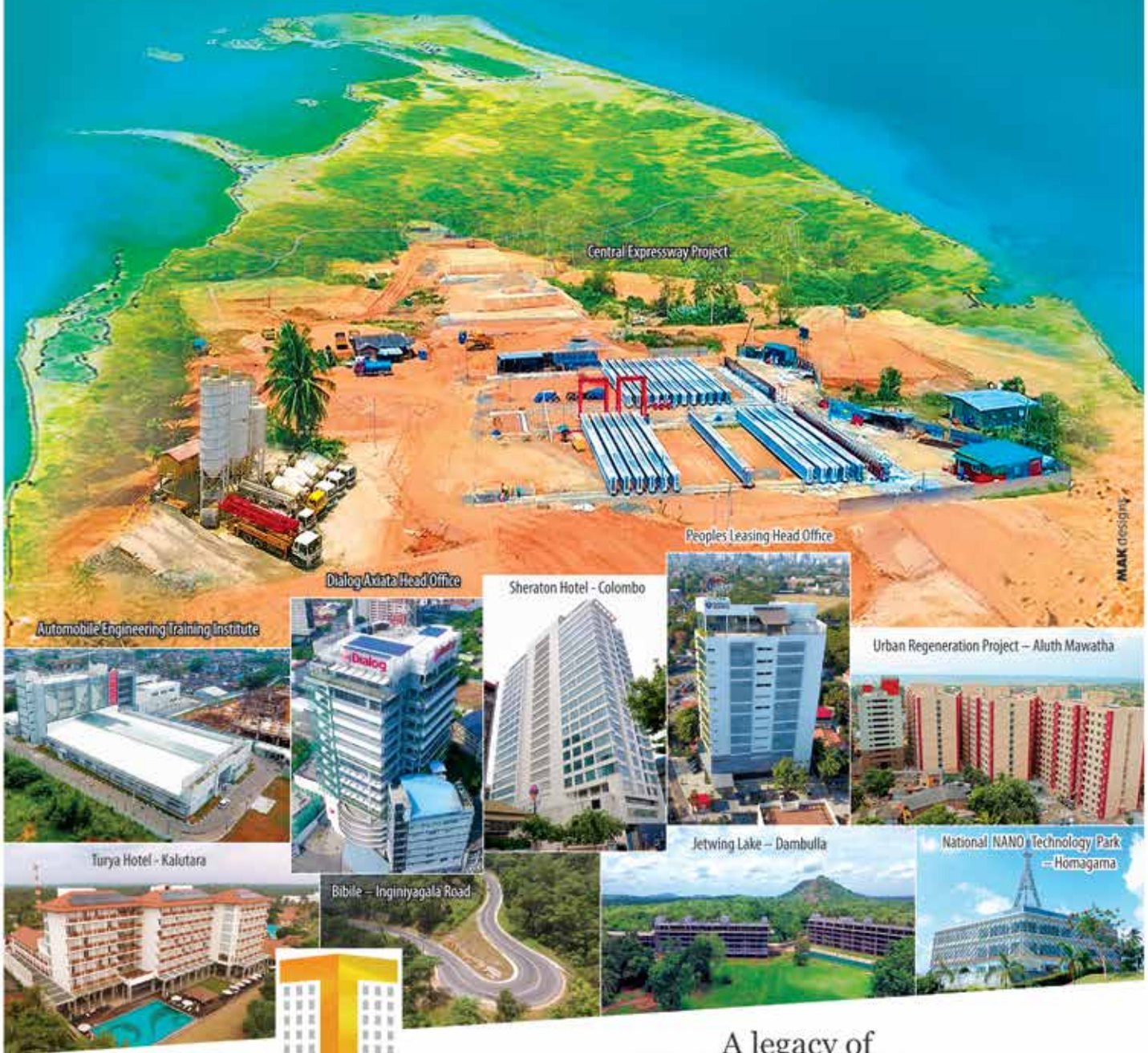

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Five Interesting Stories About World Famous Architecture

By Shanika Gamage

"As an architect, you design for the present, with an awareness of the past, for a future which is essentially unknown" – Norman Foster

Throughout the human civilization, we always had many interesting stories to tell, but buildings have much more than that. They have the countless stories of generations of humans along with their own.Those stories teach us about the history of the world, the nature of humans, and the cycle of life. We at Sri Lanka construction today, was able to do a research and find such six interesting stories from around the world. Here's looking in to them, with all the humor, the irony, and the regret, behind these world-famous buildings.

The Remnants of the Parthenon in the Acropolis
1. Parthenon – Athens, Greece

If you are an architect then you, definitely, know the ancient Greek Temple for being the image of architectural perfection, and if you are not an architect, then you are at least familiar with that distinct grandeur of the Greek temple and its connection to the widely popular Greek Mythology. The temple which was dedicated to Athena, the Greek Goddess of wisdom, has been living for, almost, 2,500 years now and it has a lot to tell. Its first turning point was when it got converted into a Christian church during the Byzantine rule. The church became a Catholic; then it was returned to the Orthodox during the Ottoman Empire rule before it was made into a mosque. While all the wars and raids have taken their toll on the aging structure, it could remain intact. The biggest destruction it faced, during its lifespan, was two centuries later, during the siege on Athens in the Great Turkish War. The temple, at the time, was used for the storage of Gunpowder, by the Turks, so when the Venetians led by Morosini directly hit the ancient temple by a cannon shot, the destruction was massive. The temple lost its roof and many of its walls, columns, and sculptures. It remained in its torn down state for more than 300 years, before the Greek government started working on its restoration along with other monuments in the Acropolis in 1983. The restoration work was successfully completed in 2010.

Five Interesting Stories About World Famous Architecture (Contd...)

World Construction Symposium

-Past to Present-

After the end of the 30-year civil war, Sri Lankan construction industry was experiencing a boom due to the multitudinous developments that flourished country-wide in parallel with the stabilisation of the economy. Considering the challenges faced by the construction industry, Ceylon Institute of Builders and the Department of Building Economics, University of Moratuwa initiated an annual conference series titled "World Construction Symposium" to address the global and local issues. The first symposium was held from 28 to 30 June 2012 in Colombo, Sri Lanka under theme of "Global Challenges in Construction Industry". The sub-themes of the symposium covered a wide spectrum of areas including construction in developing countries, sustainability and energy management, procurement and integrated project delivery, stakeholder management in construction, multinational construction practices, construction quality and productivity, construction research and education and law and dispute resolution.

The Second of the World Construction Symposium series was successfully held from 14 – 15 June 2013 at Cinnamon Lakeside Hotel, Colombo, Sri Lanka. The theme of the symposium, "Socio Economic Sustainability in Construction" was appraised as timely, since Sri Lanka was developing its built environment and infrastructure and that issues relating to socio-economic sustainability of the construction industry were of major concern.

The third consecutive Symposium was held from 20 – 22 2014 June in Colombo, Sri Lanka. The main theme of the symposium was "Sustainability and development in built environment: the way forward". Having focused on the socio- economic framework of the Sri Lankan construction industry at the preceding symposium, the theme was well-timed. The sub themes of the symposium included sustainability related aspects such as green buildings, sustainable urbanisation, sustainable construction practices; innovative green technologies, sustainable procurement strategies, environmental economics and management, energy management, sustainable facilities and so on.Most importantly, Built Environment Project and Asset Management (BEPAM), a journal published by Emerald Group Publishing, arranged for two awards as the BEPAM Best Paper award and BEPAM Highly Commended Paper award, which was consecutively arranged in the subsequent World Construction Symposiums as well.

The Fourth World Construction Symposium 2015 was held from 12 – 14 2015 June at Galadari Hotel, Colombo, Sri Lanka, under "Sustainable Development in the Built Environment: Green Growth and Innovative Directions".

The symposium provided a platform for both academic scholars and industry practitioners to present innovative ideas, share knowledge and collaborate on green growth, innovative directions and sustainable future in the construction industry. The sub-themes of the symposium included areas such as green buildings, cost management; process improvement; Building Information Modelling (BIM) and information management, innovative green technologies, sustainable procurement strategies, Public Private Partnerships (PPPs) and green innovation, PPPs for a sustainable built environment, environment economics and management.

Subsequently, the Fifth World Construction Symposium 2016 was held from 29 – 31 July 2016 at Galadari Hotel, Colombo, Sri Lanka. The main theme was "Greening Environment, Eco-Innovations & Entrepreneurship". The symposium was focused on a different dimension of the sustainability concept. The theme was pertinent since the Sri Lankan construction industry is expected to reinforce the economy while acknowledging sustainability and eco-innovations, which are fundamental to the country's development. The sub-themes focused primarily on green buildings, sustainable urbanization, sustainable construction practices, affordable sustainability, socio-economic sustainability, sustainable materials/green building materials, green rating and etc.

The Sixth World Construction Symposium 2017 was held from 30 June – 02 July 2017 at Galadari Hotel, Colombo, Sri Lanka, which was on the topic "What's New and What's Next in the Built- Environment Sustainability Agenda?". The prospective theme reflected the critical aspects to be considered concerning a sustainable built environment, in order to establish the future agenda. The sub-themes focused basically on affordable sustainability, Building Information Modelling and information management, cost management, disaster management, education of sustainable construction, energy management, entrepreneurship and environmental economics and management.

The last of the preceding symposiums, the Seventh World Construction Symposium 2018 was successfully held from 29 June to 01 July 2018 at Galadari Hotel, Colombo, Sri Lanka. The main theme of the symposium was "Built Asset Sustainability: Rethinking Design, Construction and Operations". Concentrating on varied and abundant challenges encountered in the construction industry, alongside the fast-paced technological advancements, revisiting the design, construction and operational principles can be recognised as timely. The keynote speech was delivered by Prof. Peter McDermott from the School of the Built Environment, University of Salford, United Kingdom, on "Putting sustainability at the heart of an industrial strategy: social value for the construction and infrastructure sectors".

The symposium was inaugurated with the presence of Chief Guest, Hon Malik Samarawickrama, Minister of Development Strategies and International Trade and guest of honour Prof. K.K.C.K. Perera, Vice-Chancellor, University of Moratuwa. Liverpool John Moores University, United Kingdom, Centre for Innovation in Construction and Infrastructure Development (CICID), The University of Hong Kong, Hong Kong, Indian Institute of Technology Madras (IIT Madras), Western Sydney University, Australia, East Carolina University, United States of America, Colombo School of Construction Technology (CSCT) and CIB-W122: Public Private Partnership joined hands as associate partners. Sixty-three (63) papers were presented during the Symposium by both local and international scholars, stimulated a rich debate on the topics on the agenda. Furthermore, BEPAM awarded two (02) BEPAM highly commended paper awards besides the BEPAM Best Paper award.

This year, the Eighth World Construction Symposium will be held from 08 - 10 November 2019 at Hotel Galadari, Colombo, Sri Lanka, under the theme "Towards a Smart, Sustainable and Resilient Built Environment". The concepts of smartness, sustainability and resilience have been of intense and broad interest, since the world is now endeavouring to intertwine these concepts with the modern built environment. On the other hand, Sri Lanka is anticipating to instigate different initiatives on urban and metropolitan development and hence, the concepts of smartness, sustainability and resilience are indispensable. Therefore, the theme of this year's Symposium is felicitous. The Symposium is expected to reflect a range of diversified issues pertaining to achieving a smart, sustainable and resilient built environment.
Liverpool John Moores University, United Kingdom; Centre for Innovation in Construction and Infrastructure Development (CICID), The University of Hong Kong, Hong Kong; Built Environment Project and

Asset Management (BEPAM): Journal, published by Emerald Group Publishing; Indian Institute of Technology Madras (IIT Madras), India; Western Sydney University, Australia; and Colombo School of Construction Technology (CSCT), Sri Lanka have extended their joint hands as associate partners. Similar to the last few years Symposium, BEPAM has made arrangements to give away several awards, including the BEPAM Best Paper award and two (02) BEPAM Highly Commended Paper awards. BEPAM will further issue a special issue based on the best research papers presented at the symposium. This year, we are happy to inform that the Proceedings of the World Construction Symposium has been accepted for inclusion in Scopus.

Sixty-two (62) papers will be presenting in the 8th WCS by both local and international scholars pertaining to the main theme. Many researchers, industry practitioners and students from Australia, Hong Kong, South Africa, Sri Lanka and United Kingdom, will take part in this symposium to share their ideas in the area of sustainability in built environment. The diversity of participants stimulated a rich debate of the agenda items.

Prof. Andrew Ross, Professor of Construction Project Management at Liverpool John Moores University, United Kingdom and Prof. Wei Pan, Executive Director of Centre for Innovation in Construction and Infrastructure Development (CICID) and Associate Professor at The University of Hong Kong will deliver keynote speeches on "Collaboration for a Sustainable Construction Industry" and "A Smart, Zero-carbon and Modular Future of Buildings", respectively. On the second day, postgraduate workshop will be held to share experiences and best practices of both postgraduate students and academics.

Indistinguishable from previous Symposiums, the Eighth World Construction Symposium will pave the path for academic researchers to make the acquaintance of industry practitioners, in order to identify the gaps existing in the industry, so as to swap the knowledge to inspire and foster the construction industry to achieve a better construction industry.

Dr. Yasangika Sandanayake
Scientific Committee Co-chair
World Construction Symposium.

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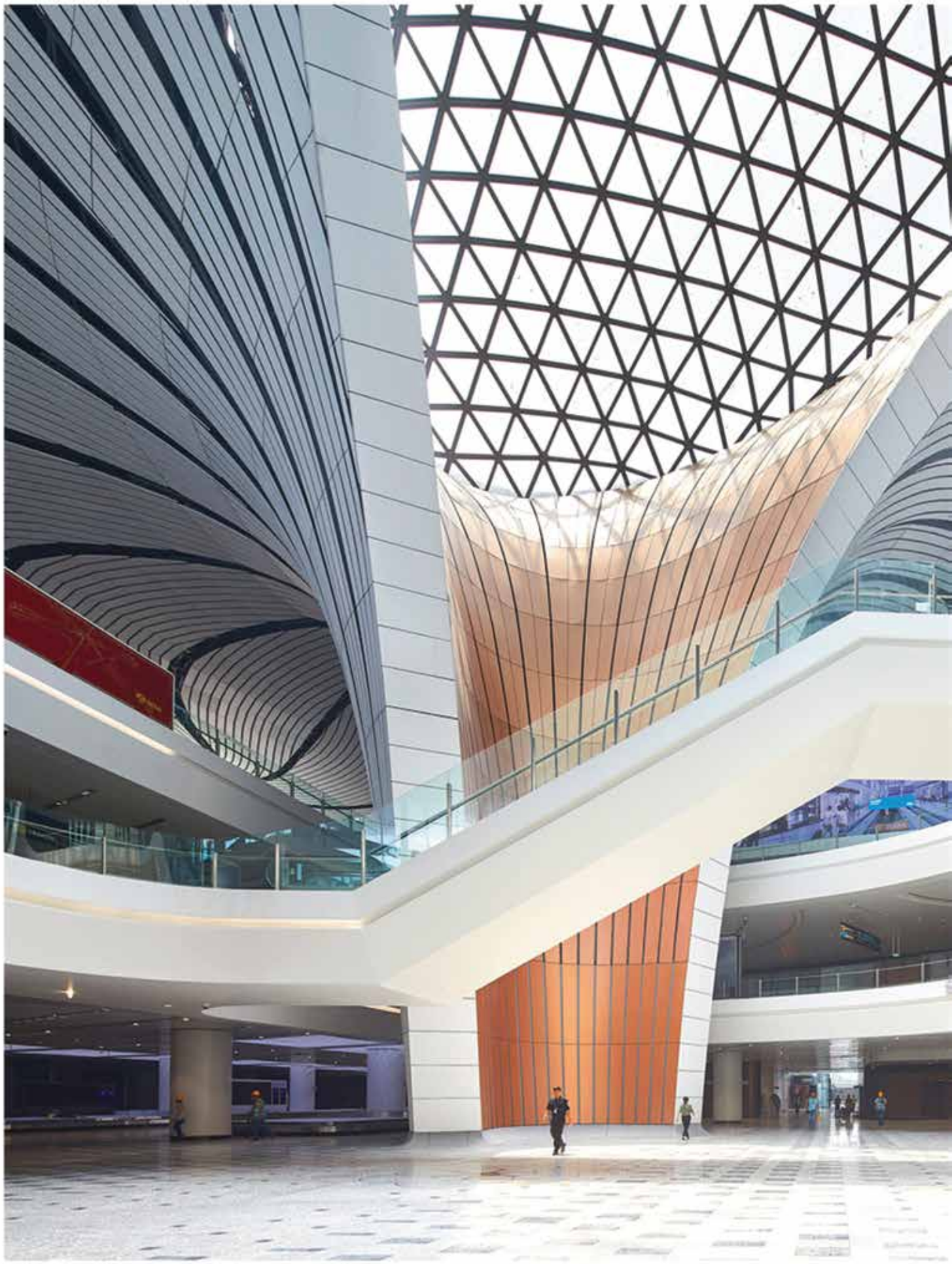


An architectural feat;

Beijing Daxing International Airport now open with World's Largest Terminal

Becoming the largest single-structure airport terminal in the world, with an area of more than 1,000,000 m2 (11,000,000 sq ft), the Beijing Daxing International Airport was opened to the public on September 26, 2019.

The $11 billion facility will initially serve 45 million passengers per year and will accommodate 72 million travellers by 2025 and is planned for further expansion to serve up to 100 million passengers and 4 million tonnes of cargo. The airport terminal includes an 80,000m2 ground transportation centre offering direct connections to Beijing, the national high-speed rail network and local train services, providing a catalyst for economic development in Tianjin and Hebei Province. Recently assigned the airport code 'PKX' by the International Air Transport Association, Beijing Daxing sets a new standard in air transport services, serving the region's growing population within a compact and efficient passenger terminal that is adaptable for future growth.

Echoing principles within traditional Chinese architecture that organise interconnected spaces around a central courtyard, the terminal's design guides all passengers

seamlessly through the relevant departure, arrival or transfer zones towards the grand courtyard at its centre - a multi-layered meeting space at the heart of the terminal.

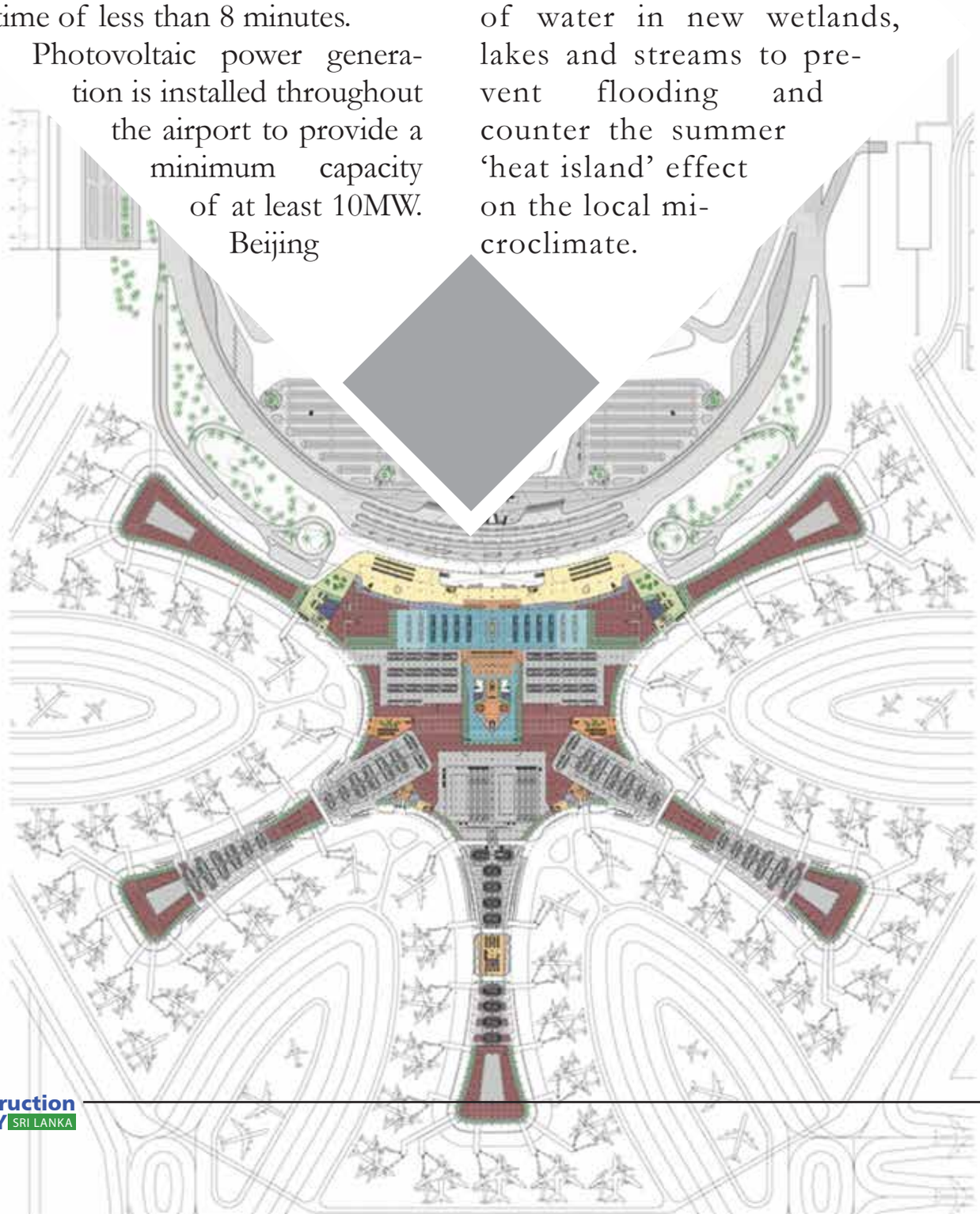
Six flowing forms within the terminal's vaulted roof reach to the ground to support the structure and bring natural light within, directing all passengers towards the central courtyard. Natural light also enters the terminal via a network of linear skylights that provide an intuitive system of navigation throughout the building, guiding passengers to and from their departure gates. Structural spans of up to 100m create the terminal's generous public spaces and allow the highest degree of flexibility for any future reconfiguration.

The compact radial design of the terminal allows a maximum number of aircraft to be parked directly at the terminal with minimum distances from the centre of the building, providing exceptional convenience for passengers and flexibility in operations. 79 gates with airbridges connect directly to the terminal which can rapidly process the passengers of six full A380 aircraft simultaneously. Five aircraft piers radiate directly from the terminal's main central court where all passenger

services and amenities are located, enabling passengers to walk the comparatively short distances through the airport without the need for automated shuttle trains. As a result, the terminal's compact design minimises distances between check-in and gate, as well as connections between gates for transferring passengers. This radial configuration ensures the farthest boarding gate can be accessed in a walking time of less than 8 minutes.

Photovoltaic power generation is installed throughout the airport to provide a minimum capacity of at least 10MW. Beijing Daxing's centralised heating with waste heat recovery is supported by a composite ground-source heat pump system incorporating a concentrated energy supply area of nearly 2.5 million m2.

The airport also implements rainwater collection and a water management system that employs the natural storage, natural permeation and natural purification of up to 2.8 million cubic meters of water in new wetlands, lakes and streams to prevent flooding and counter the summer 'heat island' effect on the local microclimate.



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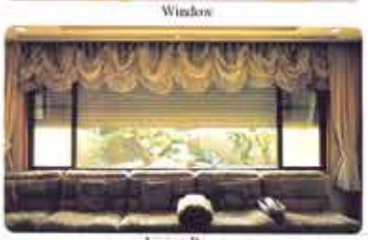
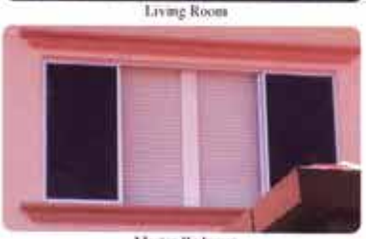

Living Room


Kitchen

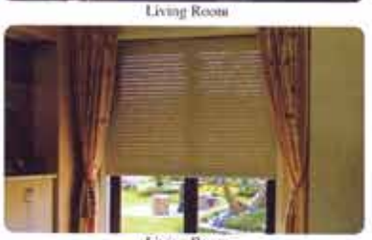

Bungalow House


Master Bedroom


Living Room


Kitchen


Air Well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How to recover the Construction Industry from the present crisis

– A proposal from the industry to the future President of Sri Lanka –

By Dr. Rohan Karunaratne, President, CIOB & Vice President, CCI.

Ceylon Institute of Builders organized a Members Forum to discuss the way forward to address the crisis in the construction industry encountered in recent times. These findings were forwarded to the Chamber of Construction Industry to formulate a report based on issues and proposed remedial actions to be handed over to the Presidential Candidates contesting in the forthcoming presidential election. With the consultation of 12 institutions, around 10,000 professionals and over 300 companies in the membership, the following identified issues in the construction industry were included in the report compiled by the Construction Chamber. Dr. Rohan Karunaratne, President of Ceylon Institute of Builders and a Vice President of the Construction Chamber explained the concerns and proposed actions incorporated in the report to revive the construction industry in Sri Lanka.

Ongoing concerns:

Contribution to GDP:

The highest growth rate in the Sri Lankan construction industry was reported in the year 2012 and it was a 20% growth. During this period, the reported percentage was equal to the percentages received in the developed countries in Asia. The contribution to the country's GDP by the construction industry was 10.6% at that time.

Continuous declining in the industry:

Since 2015 the construction industry in our country has encountered with a descending movement. As such the growth has been decreasing towards 8% during the recent times. With this drop the contribution to the country's GDP also got reduced to around 5%. Not only the small and medium companies but also major construction companies have faced with many financial difficulties. The industry professionals who depend on the sector for their survival, other staff in companies and construction workers are in danger of losing their jobs.

Very high construction cost:

The very high cost per square feet in Sri Lanka is one of the most challenging issues. Sri Lanka's cost of construction has only become second to Singapore rates in comparison to other South Asian countries. There are many reasons behind this scenario. The high cost of labour and construction raw material, high tax components and waste are among them.

Competition with foreign builders:

There is a danger of mega foreign construction companies overrunning the Sri Lankan construction industry. These gigantic foreign companies operate with various incentives offered by their own governments. Hence, the local

construction companies are encountered with a tremendous disadvantage when competing with them. Any government runs on foreign loans or Foreign Direct Investments has to join with the foreign construction companies. Yet, those foreign companies have to collaborate with local companies with at least a minimum of 40% work sharing on construction projects. Likewise, all the construction contracts based on local fundings should be offered to the local construction companies.

Problems in Tender procedures:

At present the government procurement process is mainly implemented through TEC's and PC's which comprises Government officials. There had been many allegations of irregularities on several tender awards. Some of these allegations could be based on misrepresented facts also. In every TEC and PC for a procurement costing over Rs. 100 million, a qualified person should be nominated as a member by the relevant Business Chamber. Such person should not have any conflict of interest. This will facilitate greater transparency. In the past there had been many instances of slow or no progress in development activities due to non-technically qualified persons as Secretaries and Chairmen respectively heading the Ministries and Statutory Bodies involved in development work. On the other hand majority of the few technocrats who headed these institutions in the past had performed quite well.

Proposed remedial actions:

Reduce Government taxes:

There are few suggestions which can be proposed to reduce the high cost of square feet in construction. One such suggestion is to reduce the very high taxes imposed on raw materials. Another suggestion is to start a scheme by the Government to attract and motivate the youth to join the construction sector.

Lean Management:

Furthermore, to minimize waste in the construction industry, it is proposed to implement new techniques such as Lean Management practices used in other developed countries. Training in new technology is another method to reduce cost and upgrade the construction industry.

Green Building concept:

Implementing green concept should be encouraged in all construction projects. This is another way of reducing the cost component and progressing with the new technology in the construction industry.

- Create enough work for the industry
- Fair Distribution of work
- Sub-contracting work in major projects
- Encourage Green Building concept
- Adopt Lean Management practices
- Establish a development fund / bank
- Introduce a pension scheme with insurance

Create enough work:

The government is the main benefactor of the construction industry. If it stated in a different way, the government is the main single client who provide construction contracts to the companies. During past five years the government projects offered to construction companies are very marginal.

The delay or non-payment of the funds for the work carried out for the government is another problem. On the other hand, construction companies face problems when obtain loans from commercial banks on high interest rates and their inability to settle them on time.

Fair distribution of work:

For any government in power there should be a system that the government work should be distributed not only to the major companies but also to small and medium companies in a fair manner. The system should be transparent. There should be dynamic Government officials to release funds on time. The government tender boards on construction required to be handled by the officers who have a knowledge on construction and its related activities.

Sub-contracting work:

Some major construction companies who are awarded large scale projects in the Government sector carry out their work all by themselves without giving any subcontracting work to small and medium companies. Government should introduce rules for major construction companies who receive big government tenders to allocate at least 30% of the work as subcontracts. Construction industry in Sri Lanka is not about four or five leading companies. There are about 2500 active construction companies in Sri Lanka.

Setup a Bank or Infrastructure Development Fund:

China Construction Banking Corporation is the second largest bank in the world. This specialised bank contributes an enormous support to the rapid development in China. Sri Lanka too should start a similar bank or a fund in the form of a development bank immediately to support the construction industry. There was a proposal in the last budget to establish a special construction bank like a development bank with the help of the private sector. If such a bank is opened, the capital should be about USD 100 million.

Recognition of construction services:

At present, some Sri Lankan companies carry out consultancy services and construction work in foreign countries without the support of the government. This export service which brings foreign exchange to the country should be promoted. Yet the government has not properly recognized expertise in the construction sector. This is a field that can be developed and has the ability to bring income to the country. Therefore, initially the government should recognize and accept the export services in construction sector as an important component and provide necessary and similar incentives offered to export services in other sectors. A 20% tax levy has been imposed on the income earned from the construction work in foreign countries since 2017. It is recommended to offer a tax relief to the construction export services sector for the next 5 years.

Qualified officers for Tender Boards:

Appoint qualified construction professionals to head the Ministries and Statutory Bodies involved in development as Secretaries and Chairmen respectively for a fixed term of 3 years unless removed on disciplinary grounds.

Pension scheme for construction workers:

This scheme is proposed to ensure the security of the construction workers in case of a disability or in the old age. It can be implemented through an insurance policy as a monthly pension payment. A life time pension for the worker would encourage the school leavers to join the work force in the construction sector.

Professionals for the National List:

In China and Singapore, regarded as two economic wonders, one of the main reasons attributed to the success is the high number of qualified professionals in the highest echelons of power. In China even today the Cabinet is dominated by qualified technocrats. As a start nominate at least up to 50% of qualified professionals to the National List in next Parliament.

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Basilica San Marco on the left and the Doge's Palace on the right.

2.Basilica San Marco – Venice, Italy

In his wonderful book, The Secret Lives of Buildings, Edward Hollis says "Venice is a transfigured Constantinople; but Constantinople was a transfigured Rome once upon a time, and Rome was a transfigured Greece before that." In the dark ages, stealing and reusing parts from old buildings was a common practice. However, in the case of St. Mark's Basilica, it was more than just walls and antiques, it was St Marks himself St. Mark the Evangelist was a preacher in North Africa and the founder of the Church of Alexandria. His body was kept in a sanctuary in Alexandria for 7 centuries until two merchants from Venice stole it. On the pretense of saving the apostle's body from the Muslim Arab governor, the merchants sneaked out the body by hiding it under pork meat. On their trip back to Venice, they were saved from drowning by the "miracle" of St. Mark appearing to the captain and telling him to lower the sail, saving them from the storm. The body of St. Mark was finally welcomed to Venice, and an order was issued to build a new basilica, beside the Doge's Palace, carrying the name of St. Mark to shelter his dead body. This whole story was recorded on a Mosaic that can be found above the left door of the Basilica.

You might, also, be interested in the fact that St. Mark's Basilica, as we know it, was the third one built in the same location.

The first one was caught in a fire that started in the adjacent Doge's palace, and so it was replaced be a second one; the third one, which remains to this day, is believed to have been constructed in 1063.

Five Interesting Stories About World Famous Architecture (Contd...)

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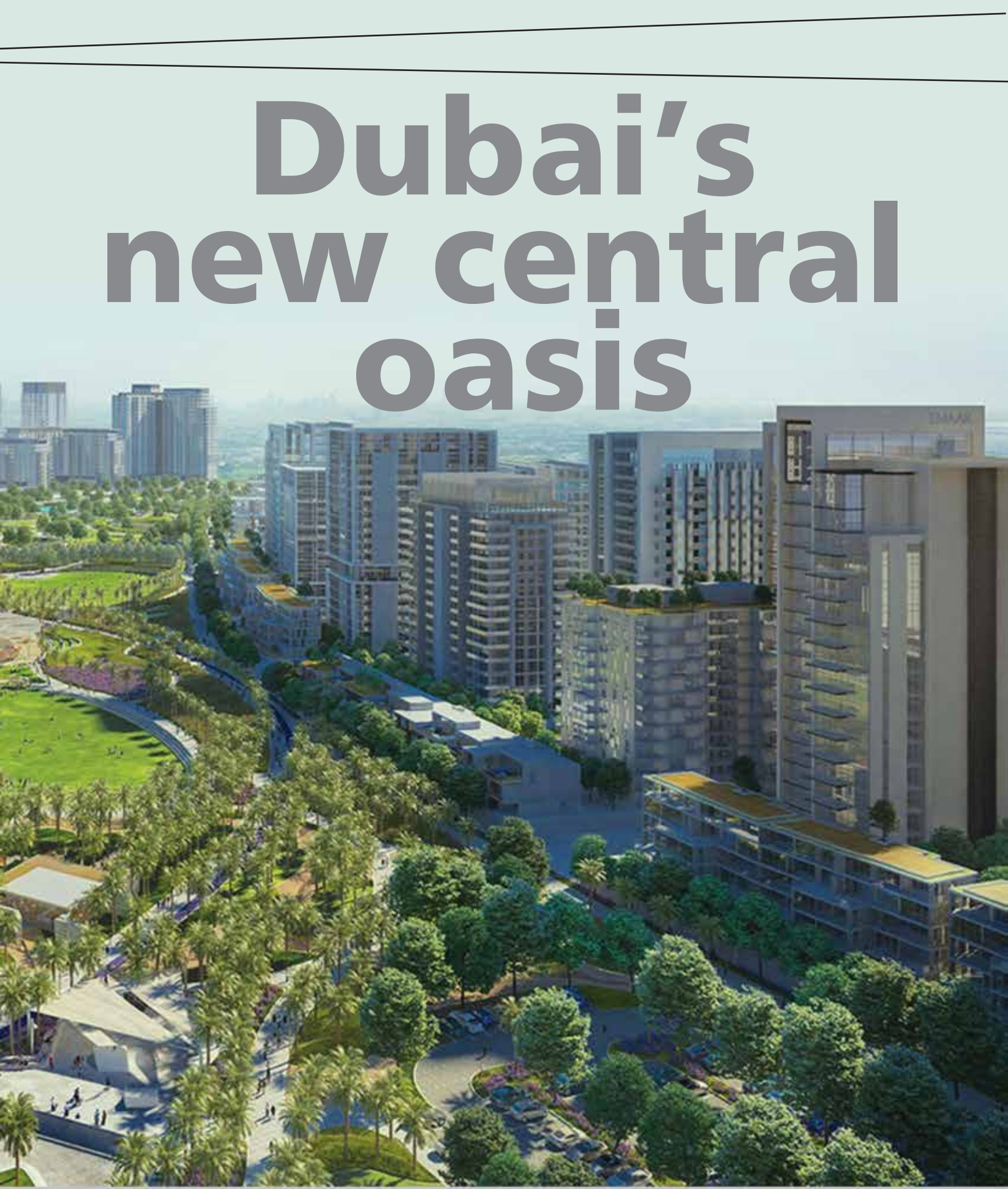

Dubai Hills Park celebrates community living with rich lifestyle choices

Dubai will soon be home to the meticulously designed Dubai Hills Park, one of the nation's most beautiful outdoor destinations in Dubai Hills Estate.

Located at the crossroads of Al Khail and Umm Suqeim Roads, Dubai Hills Estate is one of the largest master-planned communities in the city offering breathtaking views of the iconic Dubai skyline, in addition to Dubai Hills Park, mall, golf course and other lifestyle amenities. Several residential projects are available for investors, with a projected strong return on investment. Tenants, on the other hand, will benefit from a laidback lifestyle in the heart of the city.

Only 15 minutes from Downtown Dubai, apartments near Dubai Hills Park will be ready to welcome their first residents in early 2019. The park will further improve their quality of living with its assortment of activities that promote wellness and a healthy outdoor lifestyle.

According to the Royal Institution of Chartered Surveyors (RICS) in London, apartments next to or very near to a public park are proven to sell for as much as 19 per cent more than the same type ofproperty in another location. This further positions Dubai Hills Estate as a prime investment opportunity.

As a sheltered, green oasis that celebrates community life, Dubai Hills Park will be a vibrant new outdoor lifestyle hub delighting residents of Dubai Hills Estate and their guests. There is a strong positive correlation between green spaces and improved levels of mental health. The University of Exeter's Medical School has proven a long-term positive impact that frequent visits to parks and gardens can have on urbanites.

Dubai Hills Park has a size of roughly 180,000 square metres – four times the size of Place de l'Étoile in Paris. Residents of Dubai Hills Estate will be assured a relaxing getaway just minutes away from their home and the Dubai Hills Mall with over 650 retail, entertainment and dining outlets.

Drawing on the local culture and the region's natural landscape, Dubai Hills Park will have many exceptional and innovative features including an urban beach and splash park, skate park, 2.5 km jogging park, a café pavilion, and a dog park, to name a few. Weekend markets will promote community engagement and local enterprise.

The UAE's first beach-in-a-park has a sandy shored pool, a state-of-the-art splash pad, and a picnic area for families to relax while children play. Visitors to Dubai Hills Park can run, cycle, play, take a walk through the park's lush landscape, or just kick back and relax in the open spaces.

Fitness enthusiasts can hit the 2.5 km jogging track, skate park or the Dubai Hills Golf Club's 18-hole Championship golf course with world-class golf facilities. Dubai Hills Park will also serve as the finest events destination hosting ongoing seasonal events with three large events lawns.

For more information, visit the Dubai Hills Estate Sales Pavilion on Umm Suqeim Road; Creek Harbour Sales Centre in Ras Al Khor; and the Abu Dhabi sales centre on the ground floor of Al Nahda Tower on 4th Street, Al Muroor Road.

Courtesy : Mena Herald

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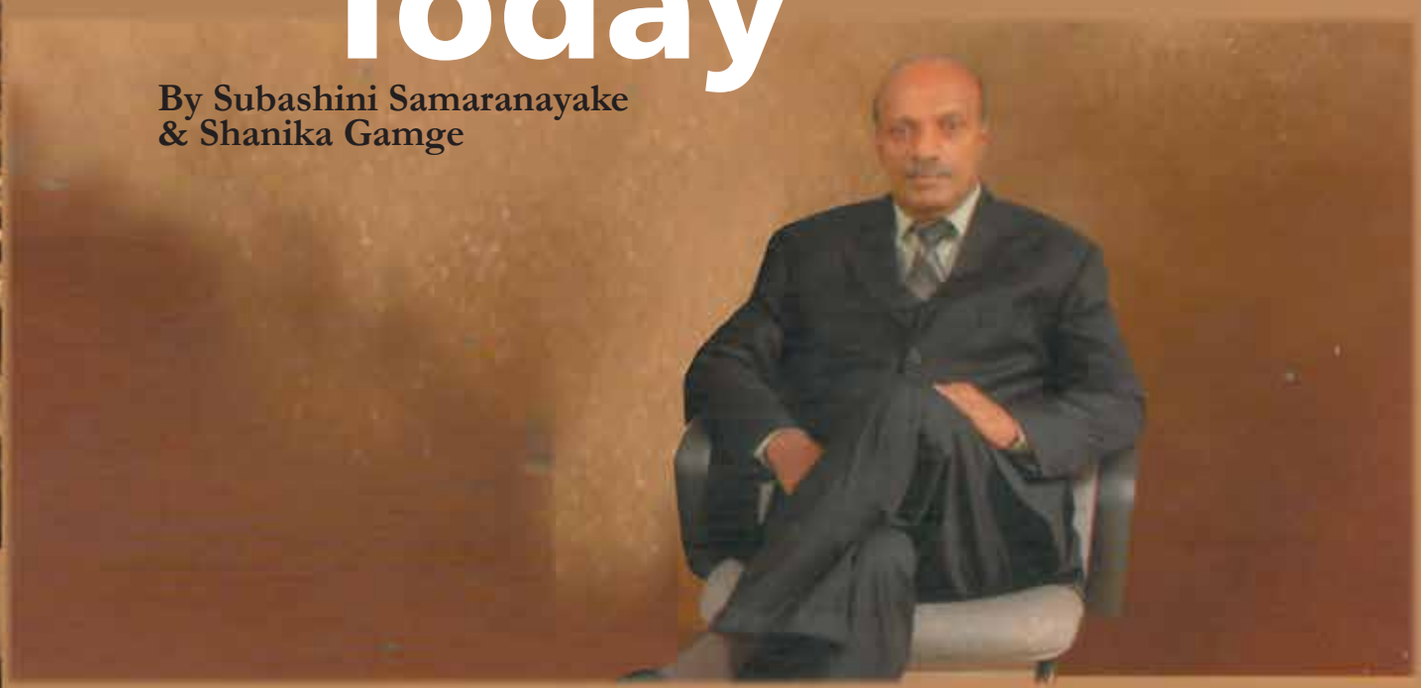
Sanken MD shares his success mantra with Construction Today

By Subashini Samaranayake
& Shanika Gamge



"The pessimist complains about the wind,
The optimist expects it to change. The leader adjusts the sails"
– John Maxwell

Colombo City Center

The construction industry in any country is the key contributor to the development of the economy and it is not different when it comes to Sri Lanka. For us, the construction industry play a vital role in the economical and physical development. Further in Sri Lankan economy, construction is the fourth highest sector after services, manufacturing and agriculture. Following the end of the armed conflict the country saw a boom in the construction industry. However, it has been documented that during the recent past the industry is experiencing a downward trend. In developing countries, the problem is compounded alongside a general situation of socio-economic stress, chronic resource shortages, institutional weaknesses and a general inability to deal with the key issues by inadequate investment plans and changing government priorities due to various sociological, economic and political constraints.

"Sri Lanka Construction Today" had the privilege of a brief discussion with Eng. Major Ranjith Gunatilleke, President of CCI and Managing Director at Sanken Construction (Pvt) Ltd. on some aspects of the construction industry. Here's looking in to what he shared with us.

The construction industry is the most important sector with regards to the development. With the end of the 30-years armed struggle construction industry became one of the major contributors towards the country's rapid economic development. However, the development rate in the industry in

Negombo Grand Beach Hotel

2018/2019 is not very healthy, and we are facing lot of challenges, said the MD of Sanken Constructions.

There is no enough work, especially for private contractors. Even though there's a huge requirement for construction work in the country, due to current economical and political situation we do not have enough projects and investors coming to the country. On top of all that, we have to compete with the foreign contractors also for the little work that is available.

There is very less involvement of foreign investors. Given the situation of the country, the political instability, we can't blame them also. Even the local banks are scared to grant loans for any construction at the moment. If the right support is given by the government for the construction industry, we will be able to attract new foreign investments to the country.

At the moment, there are no mega projects been carried out in the country with the help of Foreign Direct Investment (FDI). All most all major projects are stopped and there are no new up and coming government projects to look forward to.

Sustainability is a must in the construction sector just as in any other field. There should be a proper mechanism to ensure the work moves on. The industry cannot have a lull period, a time similar to we are experiencing right now, he added.

Even in this context, Sanken as a pioneer construction company has managed to maintain a satisfactory performance record. Asked what their mantra for the success Major Gunatilleke said there is no magic or rocket science behind their performance above others.

He said, "We always carefully select the project based on the client. If you go wrong with your choice, the consequences will be tough. Cash flow issues, bank borrowings, massive delays and all other related problems erupt when you select the wrong client and also you should know your resources".

It is most important to do a through background check in to everything we do with regards to a

project. From the client to the suppliers to and other third parties, we must be sure that they will deliver on time. As an example, when we start a project, everything is ready but if the client is not forthcoming with the plans and approvals and budgets there will be delays, same goes to the suppliers or workers. Everyone need to know the plan and what is expected from them and complete their work on time. That is why this is called a team work. Knowing your team's strengths and weaknesses will play a major role in team work.

For any industry, success is everything about discipline. Discipline has to come from top to bottom. If a manager is not disciplined, his or her team will not be disciplined, you have to walk the talk first before asking others to follow in your footsteps. That is true leadership. We make sure that at Sanken to adhere to these are characteristics.

In every industry, relationship matters a lot. When it comes to working with banks it plays a major role. The bank needs to know you and you have to earn their trust over the years. You have to have a good relationship with them. When a company has a healthy bank balance and repayment structure a bank will be able to help during hard times also. There are so many examples of where the financial institutes have come up to help their clients during hard times and both the bank and client has thrived. However, it takes time and you need to be patience. With the right background and attitude, you can convince a bank to support you and you can negotiate your terms.

Last but not least we have to understand that this is shared journey and, on the way, we need to help each other to reach our destination.

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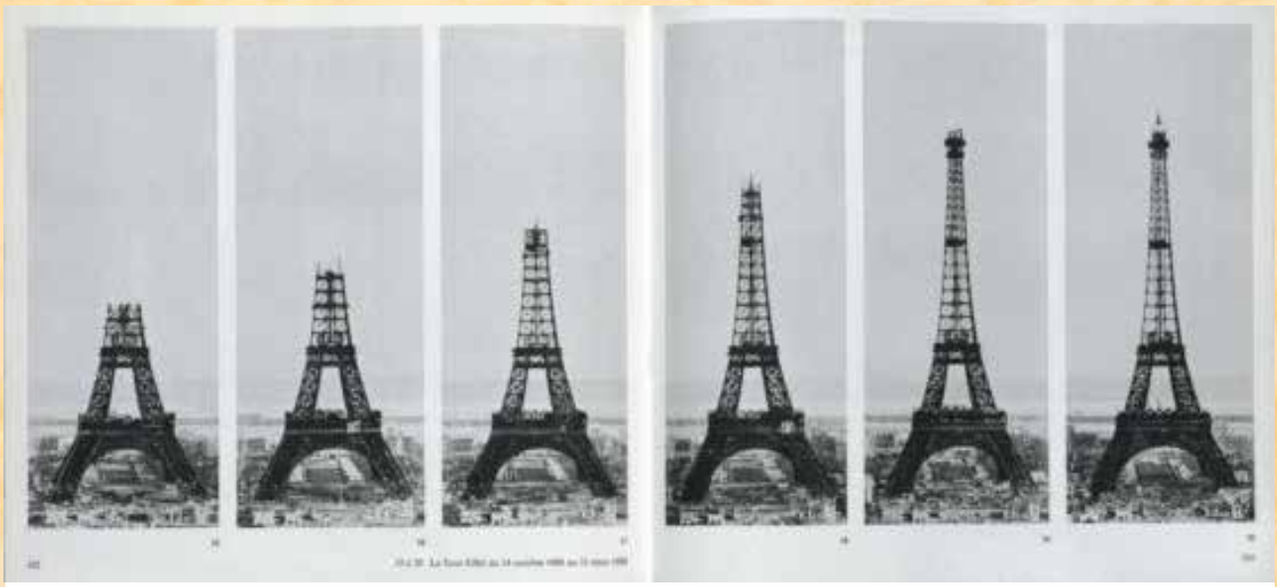

Eiffel Tower -Construction Timeline

Eiffel Tower – The world's highest structure for 40 years

3. Eiffel Tower – Paris, France

Did you know that Paris's international landmark has not always been so popular? But now considered one of the famous buildings. Built as an entrance to the 1889 World Fair in the 100th anniversary of the French revolution, the all-steel structure seemed to rise oddly in an all classic Paris. It was heartily disliked by Parisian intellects and artists who signed that manifesto: "We, writers, painters, sculptors, architects, passionate lovers of the beauty, until now intact, of Paris, hereby protest with all our might, with all our indignation, in the name of French taste gone unrecognized, in the name of French art and history under threat, against the construction, in the very heart of our capital, of the useless and monstrous Eiffel Tower." However, the famous structure, currently considered as a symbol of romance, survived all the hate. Though it was initially intended to be demolished after the exposition, it was, instead, used as a giant radio antenna, and it remained the world's highest structure for 40 years

Five Interesting Stories About World Famous Architecture (Contd...)

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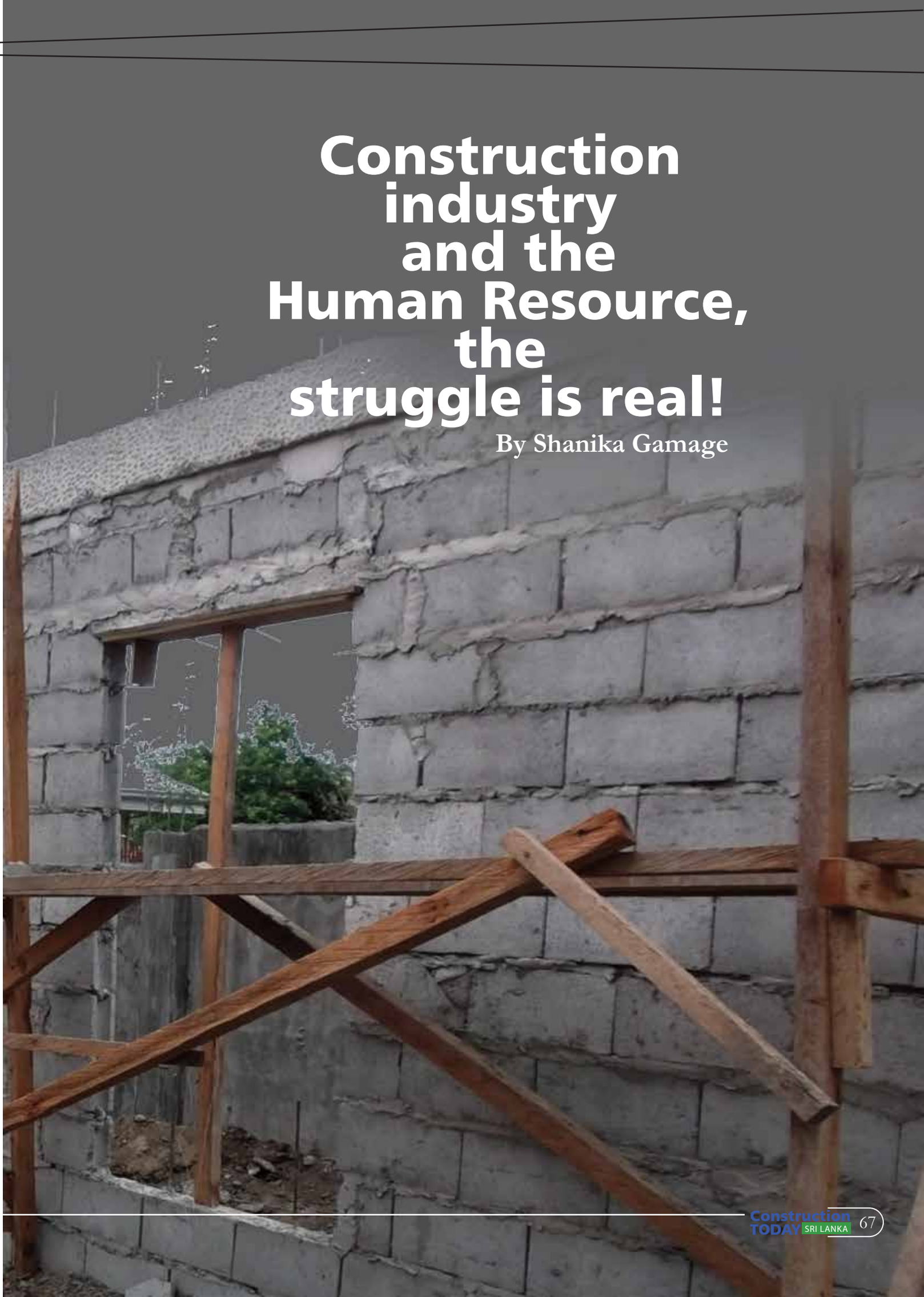
Construction industry and the Human Resource, the struggle is real!

By Shanika Gamage



"In order to build a rewarding employee experience, you need to understand what matters most to your people" – Julie Bevacqua (CRO, risepeople.com)

From the times of the kings to the modern day

The constructions industry plays an indispensable role when it comes to the economy of Sri Lanka. According to trading economics, it is the fourth highest subsector which contributed 9.3% of overall GDP in the year 2017. Physical infrastructure is fundamental to a country's development. Sri Lanka has been a wonder of constructions at the earliest stage of civilization.

The history of Sri Lanka can be seen through its architecture & constructions. Today the world marvels upon our creations. Sri Lanka is included in the UNESCO's World Heritage List. Our majestic stoopas, tanks, palaces and gardens have stood the test of the time to tell us and the world of our architectural wonders. Why it's considered as a wonder is, that these, were done without the modern machinery available today and yet are perfect in dimension and structurally sound.

According to Mahavanshaya, the chronicled history of Sri Lanka, the building materials used back then consisted of bricks that were kept together using natural clay that was mixed with other natural elements to enhance its binding quality. The next stage in Sri Lanka's construction field is colonial period where we were assailed by foreign influences. One of the prime examples of these buildings are the Dutch Fort in Galle and Colombo Fort area and the railway network.

In the modern day in Sri Lanka, after concluding the 30-year civil war, now we require a rapid infrastructure and other development as an urgent need. Therefore, construction industry needs to support the rapid economic growth of the country through the entire infrastructure development of the country.

Man power has always been an important resource from the ancient times to today and it will continue to be the key ingredient that binds all other resources such as materials, plant and equipment and finance together. This combination will result in an effective and efficient presentation of work. If we quantify the man power, it is forty percent of the direct capital cost of a large construction project.

The current situation of the labour force in Sri Lanka

According to the research conducted by me, as a nation we are facing a huge labour shortage given the reluctance of youth to join the vocation even in the post-war building boom is underway. Approximately 500,000 people are employed in the construction industry, which contributed about 6.5% gross domestic product. Industry specialists forecasted that way the things are moving there will be requirement for further about 500,000 workforces. However according to our research, there are few entrants into the trade with school leavers preferring alternative work. There are no new entrants as into the trade with school leavers are prefer to go in to other jobs like Information Technology.

During my research I was able to talk to few construction labourers and their families. They had some interesting facts to share with me. If you ask a child of a doctor or an engineer, what they want to do when they grow up, the answer 99 times out of 100 would be a doctor or an engineer just like their parents. I asked the same question from a son of a mason and the child looked down at his feet and then back at his father and said very quietly "I don't know", when I asked the same question from the father, what he would like his child to be, he said "I want him to do a job in an office, where he will be comfortable and will be earning more, I don't want him to have the hard life we are having". I further asked him why he didn't want his son to continue in his footsteps and he looked at me like I am crazy. He said "what future a mason has? What respect a mason will get?" The others also had similar thing to say. None of them wanted their children to be working in the construction industry except to become an engineer, an architecture or any other officer level jobs. It was evident that there is a huge social stigma around these blue-collar jobs.

In all most all the Asian countries, we have this stigma about certain jobs. We have this mentality; people will ask what job you are doing to determine the level of respect they will give you. It is indeed a very sad situation. But this thinking has contributed to half of the labour issues in the country.

When I spoke to few other senior construction labourers, they expressed that

there is no job security or a security for their future. "Today we will have work, but once this project is done who knows where we will end up, we go without seeing our families for a long period of times, then there are environmental changes to consider, we get burnt by the son, we get soaked by the rain, it's a hard life and no one respects us, we don't want this life for our children too"

I interviewed one widow of a construction worker, whose husband has fell to his death from construction of an apartment complex, "We got compensation, but what is money compared to a life, I am not a well-educated woman, the only thing I can do is domestic work, I have three children and two of them are all quite young, it is very difficult for me to do a job with them, all of us died with my husband" she told me with tears in her eyes and her two younger children were holding on to her skirt while the eldest was doing his homework. "my eldest getting a good job in a company or a bank is our only hope madam". There was too much pain in her eyes and voice.

One construction labourer who was drinking a plain tea during his break was heavily coughing. "This chemicals we work with is very bad for our inside", he was thoughtful for a moment, "we built these beautiful places but our children or our families will never set their foot in here, these big luxury constructions are off limit to people like us madam because we can't afford them, I don't want the same thing for my children, I want them to be able to afford places like these", there were lot of dreams and hopes in his eyes.

These are few interviews I had with them. There are hundreds and more like these. All these are evident that there are lot of grievances with regards to the labourers of the construction industry. But like all problems these also have solutions and while talking to us, most of them realized that the answers were within themselves. We only have to give a small nudge to them towards finding them out themselves.

My research led me to one of the most prestige personalities in the construction field currently in Sri Lanka. This lady is among one of the Sri Lanka Construction Today's honorary advisers, Prof. Chitra Weddikkara. She has been a key role in the construction industry of Sri Lanka for the past thirty-five years. She is a Professor of Building Economics,

a Charted Architect, a Charted Surveyor, an external examiner, an administrator and a frequent speaker at construction related professional venues.She expressed that indeed the construction field is currently facing quite a lot of issues and labour related issues are key. Due to the instability of the Government and the economy of the country, there is a shortage of construction projects and it has resulted in less work, less investors. Banks are not ready to back up the constructions industry. On top of all this the local contractors have to compete with foreign firms too. There are no proper policies in place to observe these foreign firms and to control their involvement in to the field.

These issues have a direct effect on all labour workers grievances. Things like a better pay, job security, a pension plan, better working conditions, all these depends on the amount of work construction industries has and how much of a profit can be generated. Even to provide better training and make the labour technicians a skilled force the industry needs work. And that work must generate income, even if the income is there but if the expenses are high due to taxes, it is very difficult to survive.

She also agreed about the stigma surrounding the construction labour force. She personally feels that as a nation we need to change our perception and from childhood we need to be educated to provide respect to all despite their jobs. Because specially construction work force contributes a lot to the economy of the country. She said and I quote " I always say construction is the barometer of any economy, the higher the number of construction projects in a country the higher the economical growth will be, right now its not good, but there is a silver line in all clouds, so we are hoping for a better future"

In a nutshell, it's all about the human capital and how they are treated. Humans are good in working towards a common goal with the correction motivation. In the next pages you will find them out and will also read worthy thoughts of another worthy leader in the construction field. How he managed to fight these issues. At the end its all within us.

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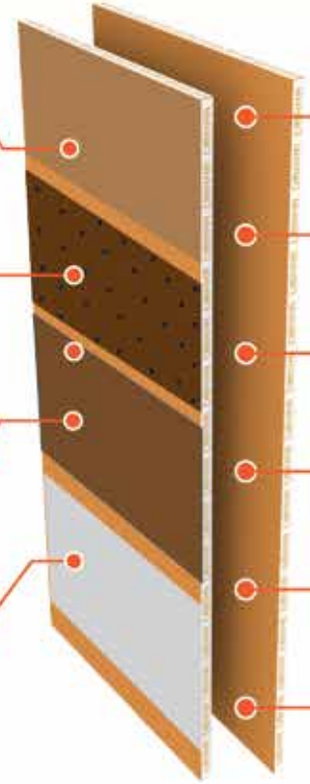

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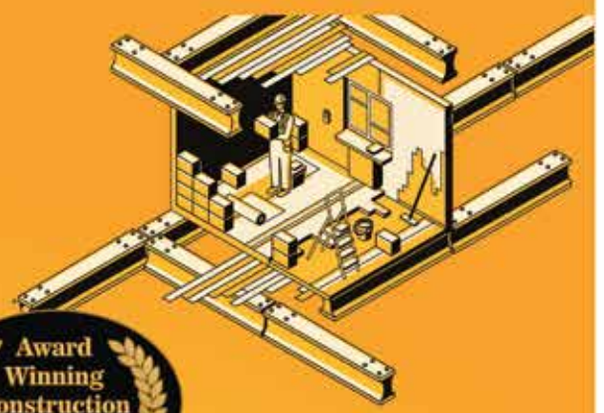

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Little Sujith's tragic death highlights the importance of precautionary measures in post-construction activities

In the last week of October, eyes around the world were focused on the small town of Nadukattupatti in the Southern Indian state of Tamil Nadu. A little boy captured the world's attention in one of the most devastating rescues in a long time.

On a Friday afternoon, two-year-old Sujith Wilson had been playing near his home when he fell into a 600 ft (~183 m) deep, abandoned farm borewell. Those who had gathered around the borewell could hear Sujith yell out in fear. Everyone, including his mother, saw him and heard him whimpering. When the child responded to calls from outside, his

Sujith with his mother
(Photo Courtesy: BBC)

mother spoke to him and assured him that he would be rescued. All remained hopeful.

However, the narrow nature of the borewell and the presence of rocks nearby made the rescue operation difficult.

Borewells are deep, narrow wells that are dug for irrigation purposes or drinking water. Usually dug by farmers, they become dangerous when left unmarked and abandoned, making way for tragic incidents such as this one.

Several Indian emergency response teams were called for the rescue mission, including the National Disaster Response Force and the State Disaster Response Force. Initially, little Sujith was stuck at a depth of about 25 feet but kept sliding down further, causing delays in the rescue effort and endangering the child's life. While Sujith was provided oxygen, officials said the muddy conditions in the borewell caused the little boy to continue to slide down to a depth of nearly 90 feet.

The entire rescue effort involved hundreds of people in an 80-hour operation. Officials first attempted to drill a 100-foot-deep hole at a location about three meters away from the borewell Sujith was trapped inside. These efforts faced obstacles because of the rocky nature of the soil with rain adding to the difficulties of the rescue operation.

Geologists speaking to media organizations indicated that the composition of the soil consisted of hard rock of quartz and feldspar. One major obstacle that rescue personnel faced was maintaining a safe drilling speed, because vibrations could have caused the borewell Sujith was trapped inside to close off completely.

Four days later, it was confirmed that Sujith had stopped breathing and hence, his lifeless body was retrieved at a depth of 85 feet.

The day Sujith's body was recovered (Oct. 27) was Deepavali, the festival of lights, for Hindus. However, the news of Sujith's death dampened the spirits of the people, especially in Tamil Nadu.

Social media platforms were flooded with messages apologizing to the little boy for not being able to save him with the message "this world doesn't deserve you" trending with the hashtag #SorrySujith. Everyone from Indian Prime Minister Narendra Modi to Tamil film star Rajinikanth tweeted their sorrow and prayers.

Even in Sri Lanka, and even in the midst of a heated presidential election, the tragedy of little Sujith's death had people crying in front of their televisions as they watched the news coverage of the rescue operation.

Unfortunately, this isn't the first incident of this kind. Earlier this year, another child faced a similar fate after being stuck in a borewell in Punjab, India. That two-day operation also failed.

According to a local official quoted in Indian media, the district of Sujith's residence had around 5,800 open borewells. Some are being used for other purposes while others have now been closed. Officials are now urging the public to notify the local government of any open borewells they find.

The inability to rescue Sujith, despite India's technological advancement in recent times, have angered people. Some on social media questioned how a nation that could sent a mission to the moon couldn't save a little boy from a depth of less than a 100 feet. They are now demanding answers from the state and central governments.

Following this latest failed recovery, a number of initiatives have been launched by the authorities, including the directive to cover or close all borewells and to impose fines for those who leave borewells open and abandoned. An IT hackathon has also been organized to identify technical equipment that could help rescue children who become stuck in borewells.

All these attempts were too little too late for Sujith's family. His father, Britto Arogiyaraj, and mother Kalamary, along with a large crowd of mourners, watched as Sujith's body was finally laid to rest.

Massive rescue operation (Photo Courtesy : PTI)

Red-brick Macey Villa on the right of Columbia University Low Memorial Library

4. Columbia University – New York, USA

Morningside Heights, in the north of Manhattan, has not always been home for the campus of Columbia University. It was first located in Park Place before moving north to 49th street and, then, moving finally to Morningside Heights in 1896. Columbia University did not move to a vacant land plot, though. It replaced Bloomingdale Insane Asylum, the first mental facility in the United States. An elegant classic building stood in place of Columbia's Low Library now. It hosted up to 200 patients and was surrounded by vast green gardens viewing the Hudson and Harlem rivers. However, with the city's development approaching the north, the asylum could keep its peace no more, and it moved to White Plains under a different name. Now, you can still find a remnant of the asylum on the grounds of Columbia University; Macey Villa which is currently known now as Buell Hall. Bloomingdale's latest building was intended for the wealthy elite patients. In spite of the prior plans to demolish it, the red-brick building still stands up to this day, keeping its distinctive style and all its parts but for a wooden porch.

Five Interesting Stories About World Famous Architecture (Contd...)

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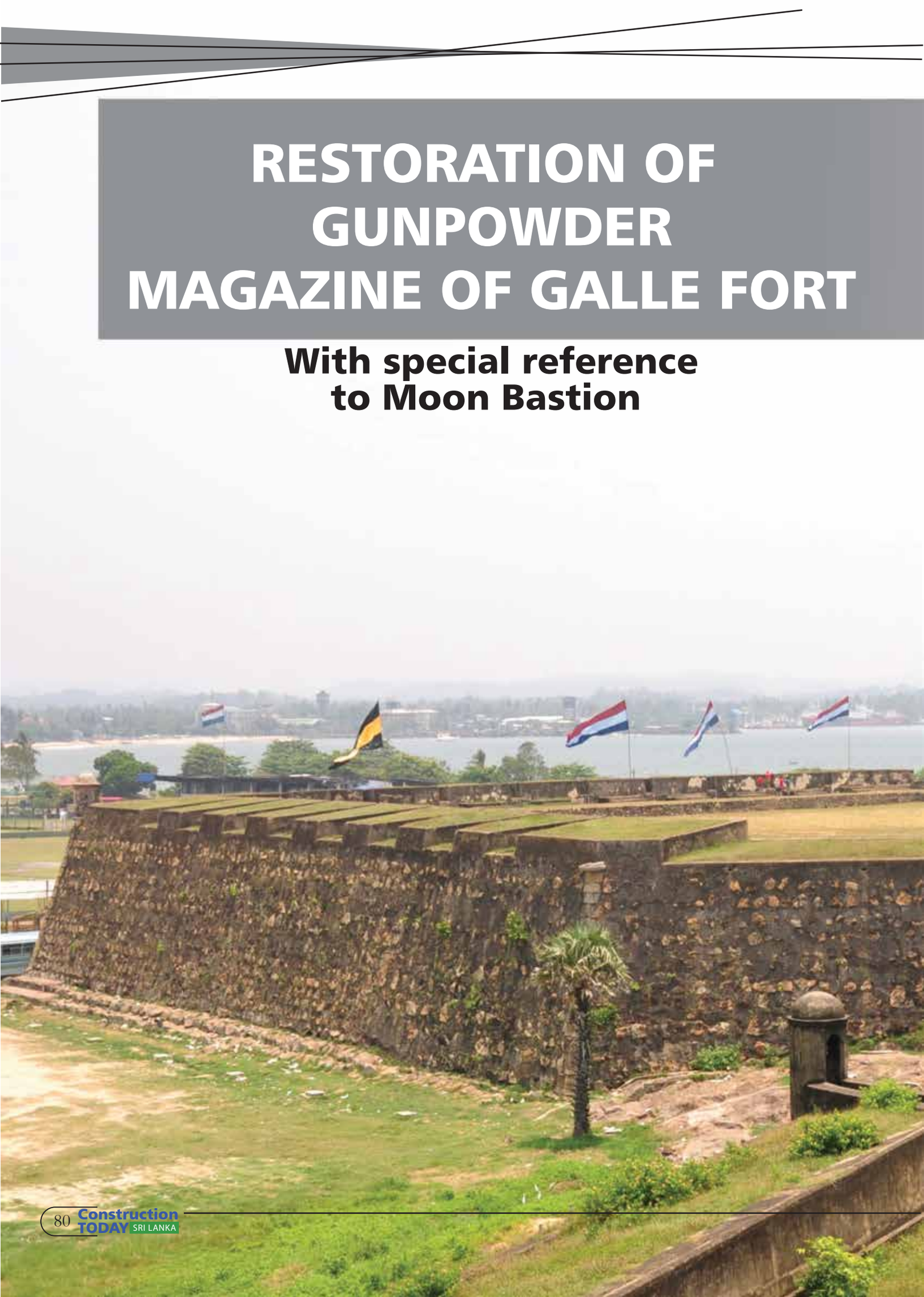
RESTORATION OF GUNPOWDER MAGAZINE OF GALLE FORT

With special reference to Moon Bastion



Prof. Samitha Manawadu

Galle Fort, which was built by Dutch in 1663 and survives today, has been enlisted as a World Heritage Site in 1988 having recognized its Outstanding Universal Values. Fort encompasses an area of approximately 40 hectares with stock of public buildings and private houses.

First Bastioned Fortification in Galle was constructed in 1588, when Portuguese stronghold of Colombo came under siege and destroyed by the army of Sri Lankan king of Kotte. Dutch army in 1640, siege the said Portuguese Fort of Galle, and, completely destroyed it, leaving the Black-fort, a very small portion of the Portuguese Fort to survive to date. Dutch began construction of much larger and stronger bastioned fortification in 1663, and competed few decades later. What remains to date is the fortification which was built in 1663. Control of Fort of Galle was transferred to British in 1796, but fortifications remained to date with no destructions.

British used the Fort as the administrative centre of their southern territories and the principal harbour until 1873; and, harbour functions were shifted to Colombo after completion of the breakwaters and founding the Port of Colombo as the principal harbour.

DUTCH FORTIFICATION OF GALLE:

Defences from the sea as well as land had been seriously considered by Dutch when designing the fort. Fort is similar to a European Fortification in terms of the built environment within it, as well in its outside appearance. Shape of the Fort is irregular due to the shape of the coastline on which the fort is situated. Bastions have been strategically located to provide a comprehensive Defence for the ramparts. Fort was completely separated from the land by a moat, which was deep and about 5.50 m in width. Dutch Entrance to the fort was provided through the gate facing the harbour, and a British added a new gate facing the city of Galle.

EXISTING CONDITION OF THE RAMPART & THE MOON BASTION:

Dutch fortification has been built encompassing the entire peninsula, which has a land area of approximately 40 hectares, by an impregnable fortification of coral and granite stones, and, with 14 bastions. Few cells, with ill-lit and ill-ventilated spaces have been constructed by carving into bastions, probably for imprisonment of offenders, or to store ammunitions and gunpowder. The dungeon inside the Moon Bastion is one of them. When the dungeon was rediscovered in 2012, it was completely & permanently blocked with brickworks to prevent its misuse by illegal occupants. The main point of discussion in this paper is the conservation of said dungeon.

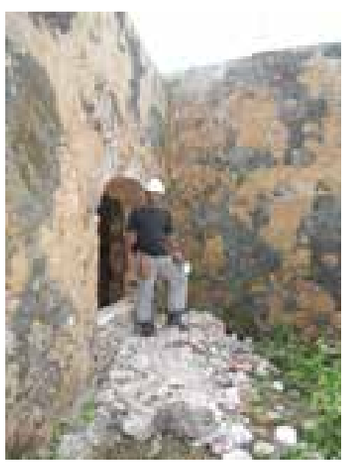
PROJECT FOR CONSERVATION OF DUNGEON S OF GALLE FORT:

In 2012, Galle Heritage Foundation requested assistance from the Centre for Heritage and Cultural Studies (CHCS), Department of Architecture, University of Moratuwa for comprehensive recording of dungeons of the Fort, and, to prepare an appropriate Conservation Plan. Project was to be implemented based on the concept of minimum interventions, as they possesses a high degree of authentic materials, and, the dungeon at Moon Bastion was the first to select under the programme. CHCS investigated altogether four dungeons, namely, Moon Bastion, Star Bastion, Aeolus Bastion and the Triton Bastion.

Galle Heritage Foundation (GHF) has intention to establish Galle Heritage Museum in the dungeon of Moon Bastion after its conservation, and funding to be obtained from the generated funds of the GHF. A private party undertook conservation

of Triton Bastion, based on the concept of Build, Operate and Transfer (BOT), with the technical assistance from CHCS. Both dungeons were conserved under the supervision of Department of Archaeology, and approval of the Special Planning Committee for Galle Heritage City.

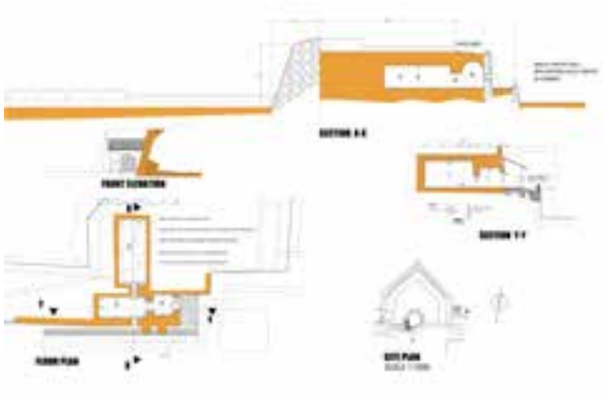
METHODOLOGY ADOPTED IN DOCUMENTATION OF PREVAILING CONDITIONS:

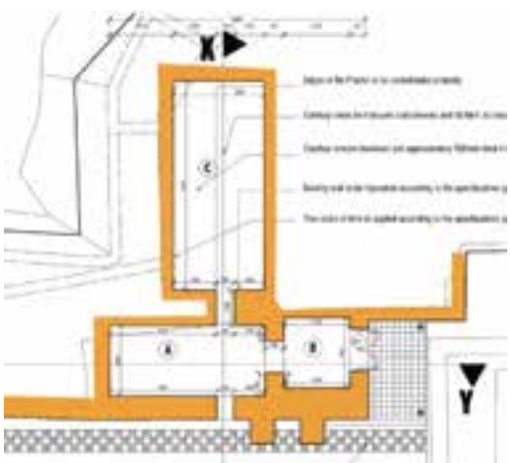


With permission from the Department of Archaeology and with the patronage of Galle Heritage Foundation, in 2012, CHCS broke open blocked walls of the dungeon, and, into the otherwise inaccessible interior of the cultural property - Moon Bastion.

Measurements of interior of the dungeon, including heights; floor levels both interior and exterior; dimensions of all spaces; and other dimensions pertinent to locate their exact position have been taken. A systematic photographic documentation, with serial views of walls, floors as well as detail photographs of damages has been recorded. Data collected by means of measurements have been composed into measured drawings in AutoCAD format for future usage. Photographs have been stored for future references. Collected plaster samples have been tested at the Conservation Laboratory of the Department of Architecture, and their outcome has been used to determine materials for structural rehabilitation of dungeon.

ARCHITECTURE OF TH DUNGEON AT MOON BASTION:





Dungeon at Moon Bastion has a single entrance facing east, and comprised of three chambers. Two of the chambers are in a linear layout along an east-west axis; main chamber is accessible through a smaller cell adjoining the sole door of the dungeon. Light penetrating through the door, illuminate both chambers with dim level. Third chamber is accessible through the main chamber, and has a restricted axis. Axis is in north-south orientation, and abutting northern wall of main chamber. Sole window located on western wall of the main chamber is positioned on the axis of the third chamber, enabling gloomy illumination from direct lights.

EXISTING CONDITION OF THE DUNGEON:

Dungeon had been sealed off without using for several decades, thus interiors were covered with large patches of fungus and algae. Interiors were emitting foul smell, and evident a rapid and extensive

deterioration. Damages and decayed inside were extensive, but not visible from outside, as the dungeon was completely blocked, concealed, and camouflaged.

Floor:

Dungeon has three chambers, namely B, C, and D; and, possess varying dimensions. Chamber B is having 3000X2700 mm2; D with 3000X6500 mm2; and D 3800X6800 mm2. Original floor finishes not recognisable due to extensive damages; and probably it could have been rugged rammed earth. At the time of opening, floor had been covered with a thick layer of sand and clay as well as dung of bats, occasionally 500 mm or more in thickness. Removal of thick layer of deposits revealed extensive damages on surface; entire floor had decayed and deteriorated badly and was loose, demanding an immediate and extensive intervention in consolidating them. Floor base was not level and was not strong enough to carry floor finishes.

Walls:

Walls are thick; and, built with coral and stone, in lime and sand mortar, and, are plastered, finished smooth with lime sand plaster. Front wall and the wall between B and C approximately 800 mm; and wall between C and D is approximately 1200 mm. Southern wall at Chamber C is 800 mm; and at the Chamber B, 1200 mm. Thickness of other walls cannot be understood as they are buried in the rampart.

Some of the walling materials are loosen and partially fallen down. Plaster is decayed and damaged, and surfaces covered with fungus and algae. Water seepage through walls was visible in some areas. Efflorescence on walls also visible, were hanging from the ceiling.

Evidence of previous conservation works can be seen on walls and openings between chambers. Standard British Bricks had been used for conservation, probably by Department of archaeology. Plasters in considerable area of wall surfaces had fallen down. Several non-dangerous cracks can be seen on walls, with slow spread of damage.

Southern wall is buttressed by two pilasters in concrete to arrest a settlement.

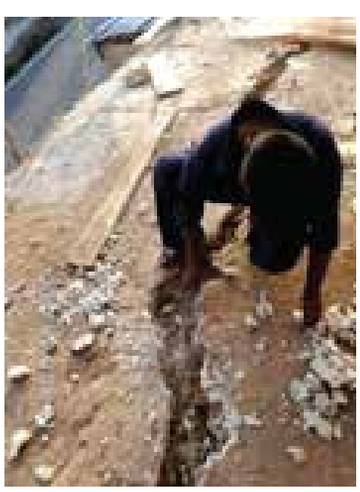
Roof/ Ceiling:

Roof is a barrel vault of stone and coral with lime motor, a similar technology to that of wall; and having a similar thickness as the wall.

Soffit of the roof is finished smooth and plastered with lime and sand plaster. Plaster surfaces are damaged and peeled off, with minor surface cracks as well as falling debris. Surfaces are discoloured, due to efflorescence.

Above the barrel-vaulted roof, a thick layer of earth fill to form the deck of the Moon bastion. Thick filing was with lateritic soil and was solid and dense. Earth fill is covered with a thick layer of concrete bedding and a finishing cement rendering, to arrest rainwater seepage to the interior through the said crevices.

A crack, spanning along length of both chambers, A and B, almost at the centre/-head line of the barrel-vault. It was a growing crack, and traces of which were visible even on the surface above the dungeon.



Door and windows:

Main door is placed on the eastern perimeter wall of the dungeon, and had been blocked by a brick wall. All door and window sashes had disappeared, either due to human actions or due to the effect of inclement weather conditions. Further, time also might have played a reasonable role in these disappearances;

Opening on front walls had been blocked with half brick walls, occasionally plastered, or in other cases plastered and white washed to camouflage with adjoining walls. Wall above the openings cracked, and vulnerable to its existence.

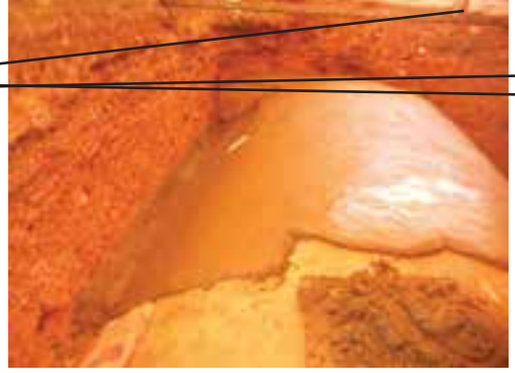
CONCEPT AND THE NATURE OF CONSERVATION PROPOSED:

Principal of adaptive reuse was implemented in conservation of the dungeon; and, has to be rehabilitated, giving attention to its causes of deterioration. A conservation programme, based on minimum interventions to original work has been planned.

Galle Heritage Foundation wishes to use the conserved dungeon as a gallery of Galle Heritage; thus, interiors of dungeon walls, ceiling, and floor had to be altered with least interventions.

Reintegrating plasters and other finishes were commenced with attending to surface cracks on walls, roofs and efflorescence. In the case of minor cracks, a mixture of lime putty, compatible with existing materials have been used. For larger cracks, epoxy grouting were internally used and covered with the layer of lime putty, to prevent them visible from outside.

New buttresses supporting the exterior surface of southern wall, provide the additional support from the vulnerable direction, preventing widening the crack.



CONSERVATION OF EXTERIOR WORKS:

Two component acrylic modified cementitious coating system has been used for waterproofing of external surfaces. It provides a hard-wearing, seamless, waterproofing membrane; and, could take sufficient negative pressure through adhesion.

In the process of Conservation of External Works, missing doors are replaced, complying with a design, derived from the tradition. As the intention is to use as Galle Heritage Gallery of GHF, door is appropriately designed with required strength, attraction and depicting the heritage of Galle.

Prevention of water seepage from vaulted roof to the interior of dungeon, which caused severe deterioration of internal surfaces, was one of the main concerns in planning conservation interventions. The roof of the dungeon is a brick built barrel-vault, and is buried at least a meter below the floor deck of the solid bastion, and water proofing it was a a tremendous task. The mission was accomplished with removing solid compacted earthwork from top of the barrel-vault carefully, and, re-compacting after completion of waterproofing works.

During the process of conservation, earth filling was removed by archaeologists, under the strict supervision of an archaeological officer; necessary structural repairs to the top surface of the barrel-vault was carried out; a levelling screed, a water proofing membrane, and a surface protecting layer was added; re-compacted the removed earth; and, top of the deck was finished with a concrete bedding and a cement rendering, similar to it, as it was before commencement of the conservation works.

CONSERVATION OF INTERIOR WORKS

Stabilisation and restoration of internal plaster works had to follow through a systematic process of applications, which include cleaning of interior surfaces; removal of efflorescence; removing of peeled-off and loose plasters if the necessity of removal is arisen; consolidation of existing plasters where it is possible; and, reintegrating plasters with plasters of similar compositions in missing areas.

Assistance of the Conservation Laboratory of the University of Moratuwa was extensively engaged in identifying compositions and testing various materials used for conservation purposes. New plaster was developed compatible with existing plaster, with the assistance from test reports, which constitute of white clay 20%, Lime 25% and Silt/ refined sand 55%; which has close resemblance with the existing plaster in composition, texture, culture and other properties.

Vaulted roofs also treated in a similar manner as of the internal walls, as no material difference identified therein. Finally, completed/ rehabilitated plasterwork was white washed, to give a brighter interior suitable for the employers decision to convert it into a heritage gallery.

Existing floors were covered with thick layers of deposited earth, dust and debris; and were first cleaned by carefully removing foreign matters. Thereafter, precautionary measures were introduced to prevent rising damp, using tested high quality waterproofing membranes.

A solid floor base was required to receive floor finishes to comply with future usage of the building. A mass concrete base of moderate thickness, in a way which could be removed without damaging the historical structure if a necessity has arisen, has been used as the floor base. A mixture of white and Gray cement, finish with titanium oxide as an adhesive, has been used inside, as the final floor finish. As the

flooring is independent from the structure, it too can remove at any-time, without causing structural damages to the cultural property.

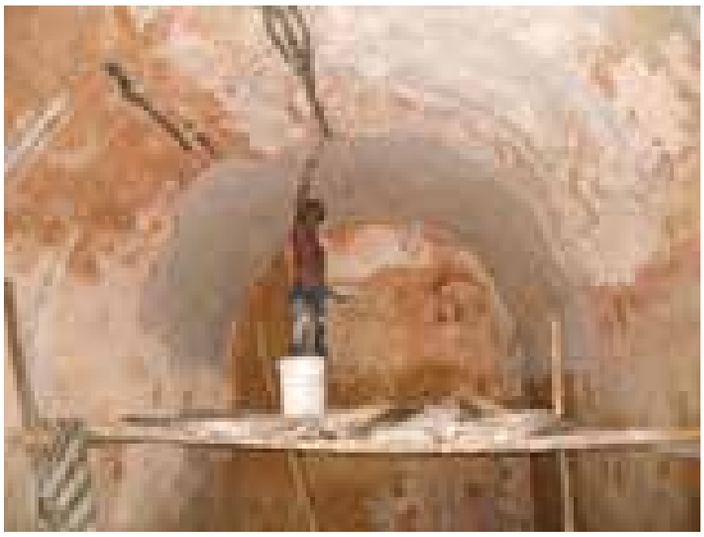
Repairing cracks and strengthening structure was one of the primary concerns during the process of conservation of dungeons. A method to crack repair, without causing further damages to the structure was necessitated, and the solution found was to use epoxy resin to fill the cracks with the help of a mighty injector instead of pressure pumping.

Method used allowed epoxy to penetrate deep into the crack by gradual and constant pressure; and, allowed even hairline cracks to be fully penetrate without any air traps. The other advantage was that, not even damage to insert the injector nozzle, but only fix the injector base firmly on the cracks by using an Epoxy Putty where cracks between injectors also sealed using same epoxy putty.

For crack filling and related repair works, a low viscosity long pot life epoxy injection resin was used, which allowed maximum penetration into small cracks and exhibit extremely high structural integrity. The low modulus resin has been designed for injection into structural cracks and was able to set in wet/damp environment. Low viscosity allowed maximum penetration into cracks.

Equipment Used in Injecting was a Mighty Injector, which consists of a reservoir containing a spring loaded plunger, filled via a grease nipple. Mighty injectors were placed directly over the cracks and affixed using epoxy putty, which sealed the surface between injectors. Advantage was that the operator only needed to fill the reservoir of the injector which then applies constants pressure from the internal spring mechanism. No need to drill or do any kind of damage to the already cracked surface in this process.

The selected resin is specially designed for warm climate, and, has a long pot life and gradual gel time making it a highly workable material. Material used has many key benefits such as an excellent adhesion; moisture insensitive; Increase working time; aggregate extendible; and, non-shrink etc.



PLASTERING WORKS:

Based on outcome of the plaster sample analyses at University's Conservation Laboratory, a compatible plaster type was developed at the site; which constitute of white clay 20%: Lime 25%: and, Silt/ refined sand 55% mixture. 20 mm thick of plaster, finish smooth with neat lime putty was applied on existing wall.

Soffit of the barrel vaulted roof has been rendered with 20 mm thick mixture of white clay 20%: Lime 25%: and Silt/ refined sand 55%; and, finished smooth with neat lime putty.

CONSERVATION PROCEDURE (New Elements):

To facilitate the new function of the conserved dungeon and to reduce environment impacts on their interior, a new roof, in a pavilion style, was constructed outside the building, abutting its eastern wall. The roof is supported by two wooden pillars and with minimum fixing to the rampart. Roof, in addition to its intended function, will act as a shading device to main door of the dungeon. In general, roof is an easily reversible solution.

Pillars made of decorative wooden to match the most popular style available within fort, and roof cladding is half-round tiles on asbestos roofing sheets. The roof is a reversible conservation measure, which can be removed without causing a slightest damage to the dungeon, whenever necessary. The above are the minimum interventions that could be incur on the dungeons in order to preserve them for the posterior.

CONCLUSION:

Some historic monuments found their natural destructions due to passive modes of conservation or museum type of conservations. In contrary, other monuments, which were based on active conservation norms, survives today, complying with backed by social systems, moderate economies with scarce resources and limited budgets. In conservation of dungeons in the Fort of Galle, resources were tapped through public-private partnerships and norms of social conservation were deployed.

Though there are set of International conventions and charters for preservation of cultural heritage, there are provisions for conservation of monuments and sites based on cultural adherence of particular society, which is exploited in conservation of Fort of Galle.

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London Bridge

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