

Engineering Newsletter 02

MOMENTS



July 2004



Civil Engineers
Ministry of Public Infrastructure and Land Transport

MOMENTS starts its fully functional existence this month, with the publication of its regular sub-titles, which we hope will be appreciated. Some of the “household” names of our Newsletter will be ASPECTS, CONCEPTS, HOT SPOTS, MILESTONE, LEGAL CORNER...

The reaction received after the publication of the first issue of this Newsletter has created much pleasure in the Team. We are indebted to all those who came out of their way to give us words of good wishes. The first publication was followed by a Reader’s Survey and its results will be discussed in this issue. The Team also expresses its gratitude and appreciation to the spontaneous and voluntary offer from many Engineers to contribute financially towards the monthly hard-copy publication of this Engineering Newsletter... Thank you...

This second issue has brought forth to the whole Team the amount of time and devotion required in publishing this Newsletter. The many working Saturdays and late night SMS’s in the preparation of this second issue are witness to this fact. We request and invite all our readers to participate and contribute their thoughts to this newsletter.

Our first issue has created “invisible currents”, instigating that our publication was illegal and insisting that we should be called Civil Engineering Section instead of Division... since this Ministry already has a Public Infrastructure Division. The Team feels that the Civil Engineering Division is too vast to be called a “section” and has proposed the re-naming of the PI Division as PI Department. However, to collaborate with our Permanent Secretary, we will adopt the “Section” till a decision is taken on this matter.

July 2004 has seen some members of the Civil Engineering Section buzzing around, with a few being (finally) given a respectable office to work. We do hope here that the amelioration in our working condition will continue and that each Engineer will soon be allotted a personal computer for their daily work.

On the office front, July 2004 had its fair share of new projects, as well as new plans. One of these is the go-ahead with the drafting of a maintenance contract on a district-basis. This will, we hope, help us to attend to requests from other Ministries for rehabilitation / improvement of their infrastructural assets in a much faster way.

On the national level, July 2004 has marked the end of yet another academic year at the University of Mauritius, and many of us will again start noticing young Engineering graduates lingering in the waiting area of the Civil Engineering Section, filling up their Eligibility / Registration forms of the sacred CRPE...

Have a nice reading time...

“...Hard work spotlights the character of people: some turn up their sleeves, some turn up their noses, and some don't turn up at all...”

Sam Ewing

Contents

• Local Views: Latest Laws	Pg3	• Aspects: Raw materials and Construction Costs	Pg6-7	• Milestone	Pg10
• Concepts: Roof Collapse	Pg4	• Opinions	Pg8	• Legal Corner	Pg10
• Hot Spot: Hijacked !	Pg5	• Feelings	Pg9	• Humour	Pg11

A new job – a new office – a welcome committee – an introduction to colleagues – an office fitted with the basic amenities: a Computer, a filing cabinet, a shelf, a working desk, an executive chair, a copy each of the Employee's manual, Code of Ethics and Rules & Regulations neatly piled up on the desk. Alongside, a letter from the responsible officer informing me of the agenda of the orientation course to familiarise myself with Governmental procedures.

Fantasy... all the above is what I would have liked to happen when I joined MPI, but alas, what was I given?



My workplace is my second home, where I spend some 55% of my daily time; I must feel comfortable and have all the facilities and amenities necessary for me to carry out my job. Besides the facilities and amenities, a good 'entente' between superiors, colleagues and subordinates creates a good working environment. One of the reasons behind the publication of the Engineering Newsletter is in fact to reinforce this existing entente between a small group of us, and to create bonds with the others.

Most of us, Engineers, enjoy a good working relationship and when required, help is always available. This has developed into friendship over the years resulting in many after-hours gathering such as barbecues and briani parties.



But, entente will not make the technical aspect move forward... for that, we need facilities... It is no longer possible that some Engineers' request for a PC has not been attended to since 2 years and they are still waiting; we have been made to understand that, in case new computers are received, priority will be give to the

expatriate Indians, *since they are better paid than us...* It is not possible too, that Engineers are expected to share a 3m x 3m office, without any conference room to hold their meetings with contractors or other officials... It is not possible that 6 Trainee Engineers are crammed into one office... Is this the Ministry of Public Infrastructure? Pictures of the current working conditions are available but will not be included here, as their truth might hurt sensible souls.



Similarly, the state of the offices in the ex-Design Section has, on numerous occasions, been reported as being unacceptable, but never has any amelioration been seen. We all know of the Monday mornings dreads, when the office will be full of the foul smell of the pesticides and fertilisers being used in the neighbouring vegetable plantation or the sight of the previous night rat-party...

We are availing ourselves of this opportunity to bring this state of things to the attention of the Ministry, which, we hope, will take steps to improve our working conditions... On this matter, MPI reminds us of the famous saying that "le cordonier est toujours mal chaussé"*; we design, supervise and look after the buildings of all other departments, but we ourselves are forced to stay in "stables".



On another front, request has been made since 2 years now, for the purchase of books with Technical and Contractual contents... we are still waiting for them... Could it be that any request by the Administration side for some management book is also considered in the same manner?

(continued on page9)



landed. Few passengers are in the building when suddenly the roof of the departure lounge of the ultra-modern Terminal 2E collapses killing four people.

(We), Engineers are always intrigued in this kind of disasters. What happened? Who is responsible? The internationally-renowned French architect Mr Paul Andreu? The Engineers? The Contractor? In future, what must be done to prevent such a tragedy?

An investigation by the French Government is focusing on whether there was a fault in the design of the building or whether short-cuts had been taken during construction.

The Terminal 2E was opened in June 2003 and cost some 750m euros (Rs 22.5bn). It has a floor space of 104,000 m² and an annual capacity of 6 million passengers. The structure is made of reinforced concrete and 36,000 m² of reinforced glass. The futuristic building was based on tunnel construction and consisted of two tunnel-like buildings connected by a central passageway. The part that collapsed was a 30m section of the roof on the outer boarding area.

Various theories on the reasons of the collapse are being discussed by structural engineers: the only conclusion so far is that something very unusual has indeed happened to this structure, which has stood up *for only a year*.

Some speculate that there may be a flaw in the materials – possibly in the concrete used to make up the series of interlocking rings which form the basis for the tube-like structure. But other experts reply that these materials would have been checked at the factory and again on site. Similarly, all the joints used would have been checked on site during construction.

Another theory is that the ground on which the Terminal 2E was built may have settled causing the structure to shift. But again this would have been taken into account during the design

Sunday 23 May 2004. 0700 at Paris' Charles de Gaulle - Roissy airport. Flights from New York and Johannesburg have just

stage and settlement can take up to ten years for ground movement to occur, but never before after only one year.

It is also most unlikely that a mistake could have slipped through at design stage as this kind of important project involves a lot of checks.

Another possible theory is the effect of temperature of materials and whether the early morning temperature had somehow contributed to the collapse. The temperature differences inside and outside of the structure had caused the shape of the building to change slightly, especially during hot summer months when the inside of the building was air-conditioned. These variations may have caused cracks in the concrete.

The latest report from the Inquiring Commission revealed that the collapse may have been caused by a weakness in the concrete. One factor for the concrete's weakening is indeed the temperature differences.



Speculations about the accident being caused by ground movement or problems appearing during construction have been brushed aside by the commission after examining photos of the site.

The suspected weakened concrete had been pierced by exterior steel ribs and this could have led to its failure by bending. In fact, the report mentions that the steel exterior supports would have reacted far more quickly to the changes in outdoor temperatures than the concrete shell. Repeated expansion and contraction of the steel ribs would have then helped to weaken the concrete at points where the ribs intersected the concrete.

A Senior Structural Design Engineer, Dr Michael Hogan, refuted the suggestion by the French Inquiring Commission that the cause of the collapse is due to the weakening of the concrete.

(Continued on page 9)

Hijacked? I can imagine a few raised eyebrows, wondering whether this is a James Bond movie... Let me explain by narrating a small story:

Year 1998 saw the creation of a para-statal body: the Road Development Authority (RDA). This body worked with a "pseudo" status, since all its technical activities were carried out by Civil Engineers of the then Roads and Planning Sections of the Civil Engineering Section, based at the Technical Office at Phoenix.

Year 2000 saw the appointment of an Officer-in-Charge (OIC) for the RDA. Subsequently, members of the Engineering Cadre, among others, were offered a temporary and "voluntary" transfer scheme to work for the RDA for a period of one year, with some monetary incentives.

Transfer... monetary incentives...
expected improved working
conditions...

Engineers were then told – "promised" might be a better word – that the RDA would be fully set-up and functional within this one year period, after which Engineers would then be given the choice to opt for a permanent transfer to that Authority, with an expected improved working conditions and salary.

Following that offer, many of the Engineers posted in the ex-Roads and ex-Planning Sections opted for that one-year temporary transfer to the RDA. As per the terms and conditions of a Memorandum of Understanding (MoU) signed to that effect, they would all maintain their respective rank and seniority position in the MPI establishment during that one-year period.

Four years have now passed... and these Engineers are still on temporary transfer to the RDA... and they are still on the MPI establishment, even though the original MoU has apparently never been renewed.... That's a very loooooong "one year" isn't it?

... four years is a very loooooong time.....

Nice story? So what is the hijacking business? Simple... Since all those Engineers posted at the RDA, are also still on the MPI establishment, it also means that the Civil Engineering Section of this Ministry CANNOT make any kind of progress and there cannot be any scope – or attempt – of promotion without first considering the choice of people who have decided to work elsewhere... Help... We have been hijacked...

Help... We have been hijacked...

Right now, the Civil Engineering Section cannot have any ambition of expansion with people at substantive posts. Our Section is currently functioning with 3PE's, 1 Ag. PE, 1 SE and 2 Ag SE, with one unit devoid of any person at the Senior Engineer level. For recall, the Engineering Section has, *so far*, a budgeted total of 5 PE's and 5 SE's. This lack of personnel at higher responsibility level is not a case of lack of competence, but rather a lack of opportunities... 'cos our opportunities have been hijacked !

(PE/SE: Principal/Senior Engineer)

A similar situation prevails in the Technical Officer grade (TO). Officially, the Civil Engineering Section has a budgeted 4 PTO, 5 STO and 38 TO, out of which *1 STO and 3 TO* have been posted at the Architects' Section.

(PTO/STO: Principal/Senior Technical Officer)

So much work...
So little resources...

The number of such officers currently posted at the Civil Engineering Section is 1PTO, 1 STO and 11TO... only... and their job is to help monitor tens of construction projects in 9 districts, carry out survey for the preparation of Tender Documents for the rehabilitation /maintenance of buildings of 24 Ministries and numerous sub-departments and to help 39 Engineers... Tough...

(Continued on page 8)

ASPECTS

Price increase in raw materials... Their cost implications on construction?

In this time of major Infrastructural developments in Mauritius, the cost of construction materials plays an important role in the expenditure of the Government as well as of the population. The construction industry is one that very rarely stagnates, despite any rise in prices; in fact, the economic growth of the country is measured by the health of the construction industry.

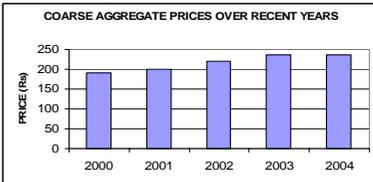
To appreciate the trend in construction costs over the years, a survey was carried out on the prices of materials and labour from year 2000 to 2004. The colour code for the charts below, where not specified, is: 2000, 2001, 2002, 2003 and 2004

The construction materials mainly used are:

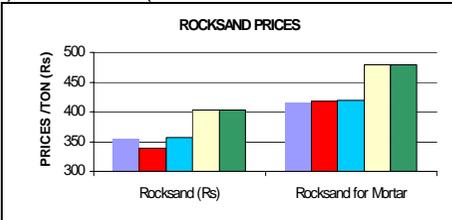
(i) Cement,



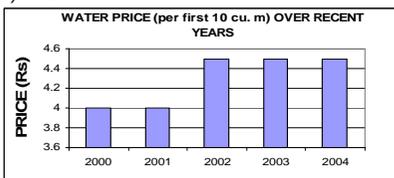
(ii) Aggregate,



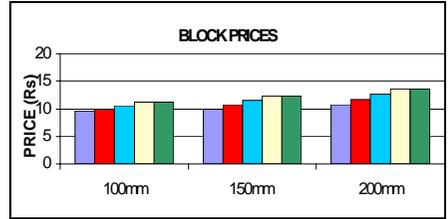
(iii) Rocksand (for concrete and rendering),



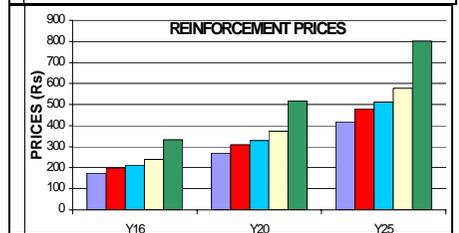
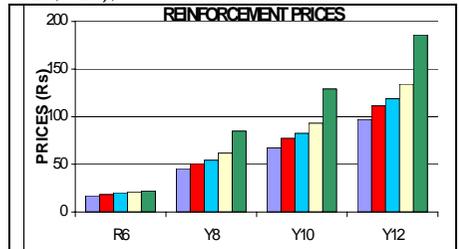
(iv) Water



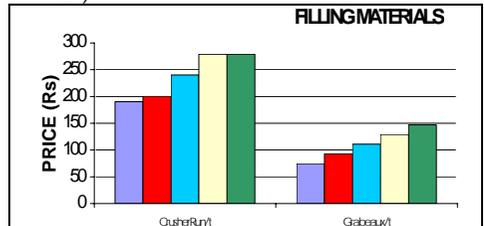
(v) Concrete Blocks (100mm, 150mm, 200mm),



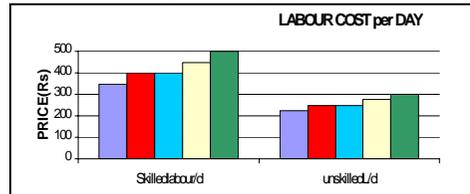
(vi) Reinforcement bar (R6, Y8, Y10, Y12, Y16, Y20, Y25),



(vii) Filling materials ('Grabeaux' and Crusher run)



(viii) The two forms of labour considered are skilled and unskilled.



ASPECTS

Price increase in raw materials... Their cost implications on construction?

The Figures above give the general trend in the price of these materials. It is noted that the prices of all these materials have constantly increased over the years.

However, our attention was mainly focused on the prices of cement and reinforcement. For these two items, the increase in prices is more drastic in 2003 and 2004. Why is this so? The main reason could be cost of freight and the supply/demand factor. There are currently several huge construction projects going on in India and China, resulting in massive order for these raw materials from these countries. With Mauritius being so out of the way, and without a marked scope for the ships to sail off with a full load of products from our country, transport costs are substantial.

In Mauritius, the culture and first priority for young couples is to always find means and ways to build their own house. What about the cost or should we say the *increasing* costs of construction?.

To further understand the impact of the construction costs, a typical house has been used as model so that the trend in construction costs from year 2000 to 2004 can be analysed. The model used is a single-storey, detached house of 150 m² in floor area. It comprises two bedrooms, a living room, a dining room, a kitchen, a toilet, a bathroom, a verandah and an attached garage. The building has shallow foundations, concrete blockwalls, reinforced concrete flat roof, rendered ceilings and walls rendered both internally and externally. A boundary wall, having a perimeter of 80m and height of 1.5m was also considered. The wall was rendered on both sides. The amount of materials, labour and cost of finishes required for the construction of this typical house was calculated and therefrom, the overall cost of the typical house was determined for the years 2000 to 2004.

This being only an estimate, some assumptions were made. These were:

- a) the cost of scaffolding, shuttering etc were included as a contingency sum which increases by 6% annually; this is roughly the average inflation rate for the last years;

- b) It took 3 months to build the house, with the use of 1 skilled labourer and 3 unskilled one;
- c) The use of galvanized openings in the building; the price thereof being Rs 55,000 in 2000, and increasing at the rate of 6% per year therefrom;
- d) The site was close enough to Port Louis for the cost of transportation of the raw materials to be considered as included in the contingency sum;
- e) The site was nearly plane and did not require extensive site-works;
- f) No painting or plumbing works or the cost of sanitary appliances are included in the calculation;

It is observed that the construction cost of the typical house amounted to Rs 443,739 in 2000. However, an investment of Rs 480,469 was required in 2001 to construct the same house. This sum increased to Rs 503,285 in 2002, Rs 551,419 in 2003 and Rs 611,889 in 2004. The



above-mentioned example indicates that the construction cost of the typical house has significantly increased over the past five years. The percentage increase in cost was 8.3% from 2000 to 2001, 4.7% from 2001 to 2002, 9.6% from 2002 to 2003 and 11% from 2003 to 2004. It can be seen that there are large increases in costs with each passing year.

Unfortunately, it appears that this trend will keep on in coming years, the more so since the recent procurement exercise for cement by the STC has resulted in very high offer values.

Nalini M-Jhowry / Sabrina Gaya

Our humble request to the concerned authorities would be to please finalise the set-up of the Road Development Authority. Let those who want to work for the RDA stay there and allow those who have chosen to be in the public service to do their work – and obtain their reward for their work – in a permanent way.

How long can people be expected to suffer injustice while others are allowed to remain in the favourable situation of "one foot in each boat" ... Please let the Civil Engineering Section live and move forward...

Kiran Bhujun

OPINIONS

The Readers' Survey

The Team carried out a readers' survey after the circulation of the first issue. Some very valuable suggestions came up, as well as much spontaneity in offering to collaborate both in terms of articles as well as financially to the monthly publication of this Newsletter, in a hard copy format. 29 Engineers, of all grades, were surveyed, and a response was received from 21 of them.

21 out of 29? Have the others read the Newsletter? Or are they not bothered? Or is it a simple lapse on their part to return the survey sheet? The Team still welcomes the survey sheet back, and is strong enough to face your criticisms, so go ahead...

Several suggestions were received about including more Civil Engineering matter in the Newsletter. The Team wishes to reassure all its friends that this is very much in line with our own plans. The complete list of our

expected subjects was included in the *Newsletter Project Brief* circulated prior to the start of this endeavour.

There were some comments about the presentation... we reckon that the black and white presentation did not appeal to all of us equally... efforts are being made to try and have forthcoming issues in colour. We wish to inform all our readers that the colour and fully printable version of the newsletter can be downloaded from our Ministry's web-page:

<http://publicinfrastructure.gov.mu>

The Team thanks all its good-wishes and promises to remain pertinent and help Engineers understand each other better.

The results of the survey are depicted in the table below:

1	Did you read the Engineering Newsletter?	100%	0%
		yes	no
2	Your appreciation about the newsletter's content	72%	28%
(a)		good	satisfactory not good
(b)	presentation	43%	57%
		good	satisfactory not good
3	Are you willing to contribute <u>articles</u> to the newsletter?	60%	40%
		yes	no
4	Are you willing to contribute Rs15 monthly for the hard-copy publication of the newsletter?	100%	0%
		yes	no

The Team

OBITUARY

The Team expresses its deepest and sincere sympathy to Mr. T. Parbhunath, Ag. Principal Engineer, whose father passed away on Thursday 22 July 2004.

FEELINGS...

The Chief Editor's Note

In life, there are people who just sit back and wait and when others take any initiative, they always come up with negative remarks.

The Team wishes to express its gratitude to the persons who, in spite of criticism and malicious attempts by the above-mentioned, have agreed to give us their support for the launching of our newsletter. Our special thanks go to the Permanent Secretary, whose support in our endeavour has been and is very much appreciated.

Previously, In life there were three types of people....
Those who make things happen
Those who see things happen
Those who wonder what has happened,

And now at MPI, the fourth type.... those who do not let others make things happen...

MOMENTS... An opportunity to make things happen...

LOCAL VIEWS

Our Working Conditions at the MPI *(continued from page 3)*



We would here like to make a request to our Permanent Secretary to consider dividing the Ministry's budget into equal parts, and allowing the different Head of Sections, like the Chief Engineer in our case, to decide how to spend that allotted financial resources, with the PS still retaining a supervisory authority to the same.

Such a decision would help ensure that the requests of the various professional cadres are indeed being satisfied; it will also ensure

that the quality of the material obtained is as per our requirements, and not as per the choice of the Stores Department... the case of the sub-standard safety shoes - with "unrecognised" supplier's original sample, is still very much vivid in our mind. While on this topic, we salute the Store's decision to buy six (6) (poor quality) sofa sets for the Technical Office and only a handful of executive chairs, when the original request was for two sofa sets and at least 20 exe-chairs... Someone, please do something!!

The Team

CONCEPTS

Roof Collapse: The Paris Airport Case *(continued from page 4)*

He said that this hypothesis is totally misleading. For him, the cause of the collapse is due to the structural instability of the architect's foolish design concept.

He mentioned that the collapse follows the

concept of "Euler Buckling" and the use of a giant elliptical eggshell with huge perforations makes no sense

Up to now no date has been set for a final report on the disaster by the French Inquiring Commission. This

publication will come up with more news on this matter.

Norbert Seevathean

MILESTONE

Farewell... and Best of Luck...

August 2004 will see the first of a series of exits from the Civil Engineering Section for this year.

The Team bids farewell and expresses its sincere good luck wishes to *Mr. Anil Kumar RAMDOYAL* who is retiring from the service for immigration reasons.

Mr. A.K. Ramdoyal joined the Civil Engineering Section as Technical Officer in 1986. Before that, he worked for COGEFAR/SPIE Batignoles, a Franco-Italian contracting firm, on the hydro-electric project at Montagne Blanche. He also worked for KIER International, a British Contractor in the construction of the SSR International Airport. At the MPI, he worked

as TO in the Quantity Surveying Section for a period of 4 years.

Mr. A.K. Ramdoyal was appointed as Engineer (Civil) in 1990 and was immediately seconded to the ex-Ministry of Urban and Rural Development (MURD)

where he occupied the post of Engineer and then Acting Advisor on Engineering Matters. He joined us back at the MPI Civil Engineering Section in June of this year.



July B'day Boys

- *MAB Furzun*

August B'day Boys

The Team wishes a Happy Birthday to:

- ❖ *Ahmed Gopaul*
- ❖ *Ramesh Ramdhan*

Football News

It's sad news, but it has to be told nevertheless... The MPI Football team lost their match against the J. Nehru Hospital Team. The score: 2-1. The MPI Team is hence eliminated from the Tournament. Better Luck next year guys!!

Domino Tournament

The Engineers' Winter Domino Tournament was won by the pair Kavi/Osman against Fazool/Reza. Congrats!!

This year's tournament also witnessed a few "pisso", courtesy of Aslam/Reza, Norbert/Deepak...☺ Hope future tournaments see the participation of new faces.

LEGAL CORNER

Insurance Cover for the Employer's Representative (i.e. for the representatives of the Ministry) on site has always been a pointy issue on Government projects.

The Government Conditions of Contract, in use in all the capital projects, does not make any mention of the Contractor's need to indemnify the Employer's representative on site in case of accident, wound, etc... Such a situation has happened with one of our colleague of the Quantity Surveying Section recently; and the Contractor claimed that he was not liable to provide for such insurance.

In consideration of this situation, the Building (Planning) section of the Engineering Section

Insurance Cover... Where do we stand?

has long made use of the FIDIC Conditions of Contract, with the Conditions of Particular Application including a Clause that the Employer's Representative is to be considered as a Third Party on the Contract.

Many contractors still provide Third Party Insurance Policy which states in its list of exclusions: "any employee of the Principal (the Ministry) or the Assured (The Contractor) are not to be considered as Third Party on the Contract". Given that the insurance is in the joint name of the Ministry and the Contractor, kindly note that such exclusion is detrimental to the Employer's Representative and must be amended to suit the specified Clause of the Contract.

Old is Gold

The strong young man at the construction site was bragging that he could outdo anyone in a feat of strength. He made a special case of making fun of one of the older workmen. After several minutes, the older worker had had enough.

"Why don't you put your money where your mouth is," he said. "I will bet a week's wages that I can haul something in a wheelbarrow over to that outbuilding that you won't be able to wheel back."

"You're on, old man," the braggart replied, "Let's see what you've got."

The old man reached out and grabbed the wheelbarrow by the handles. Then, nodding to the young man, he said, "All right. Get in."

Household Tips (for the newly married ☺)

1. It is time to clean out the refrigerator when something closes the door from the inside.
2. If it walks out of your refrigerator, let it go!
3. The best mini-vacuum cleaner for an after meal clean up is the dog.
4. Keep it clean enough for healthiness, dirty enough for happiness.
5. Never make fried chicken in the nude.
6. Do not engage in unarmed combat with a dust bunny big enough to choke the vacuum cleaner.
7. You make the beds, you do the dishes, and six months later you have to start all over again.
8. If guys were supposed to hang clothes up, doorknobs would be bigger.
9. My idea of housework is to sweep the room with a glance.

The Team invites all those interested in submitting articles to MOMENTS to do so as soon as possible after the publication of each issue. Please contact any of the Team members for any additional information

Articles and any suggestions towards improving the quality of this newsletter are most welcome.

Please contact any of the Team members for any additional info or direct your letters / comments to:

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Disclaimer: Opinions expressed are those of the respective authors, and are not, IN ANY CASE, to be taken as those of the Ministry of Public Infrastructure, or of the Government of Mauritius.



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