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IEM
The Institution of Engineers, Malaysia
(Penang Branch)

INGENIEUR PENANG

The Bulletin of IEM Penang Branch **September 2021**

COMPLIMENTARY ISSUE

Earthquake Design Considerations In Penang Island . . .

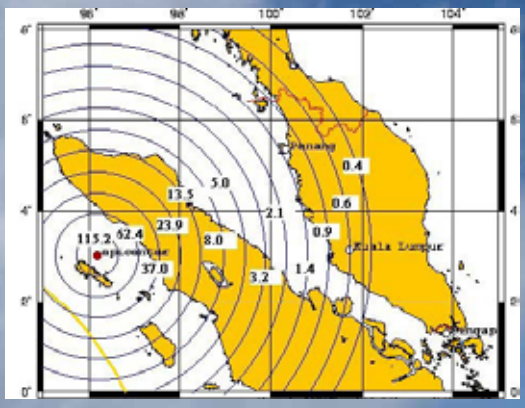

Photo courtesy of ***Ir. Chua Beng Seong***

ICP PILES

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HIGH STRENGTH CONCRETE PILES

2nd Penang Bridge, Penang, Malaysia

IKEA Distribution Centre, Selangor, Malaysia

Tanjung Bin Power Plant, Johor, Malaysia

Agile Mont Kiara, Selangor, Malaysia

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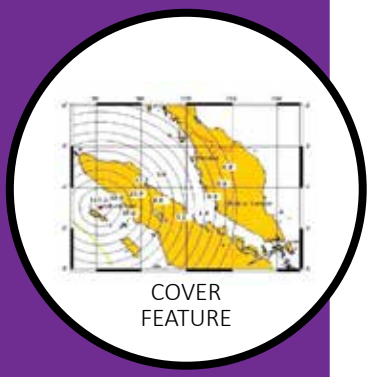

COVER FEATURE

CONTRIBUTE YOUR ARTICLES

Volunteer to contribute articles to the newsletter contact IEM secretariat (iempenangbranch@gmail.com)

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Ir. Bernard Lim Kee Weng

CHAIRMAN'S CORNER

It is indeed a great honor to be elected as the IEM Penang Branch Chairman for the year 2021 and serve for the betterment of IEM. I am honored to take up this baton from Ir. Yau, who has done a great job in transforming IEM during his tenure. IEM Penang Branch has gone a long way for me from the time when I first started serving back in the 1990s when I first graduated and was starting off as a Graduate Engineer serving in G&S Section. I have met a lot of great people who eventually turn out to be great friends. This is really a great network of people. I come from a different engineering discipline and a different industry from most of my fellow committee members, but I feel that this is why IEM is so special. We are from of different engineering disciplines, and from different industries yet we can share and help each other out when we face difficulties.

I have served under many great Past-Chairman, and it is my privilege now to serve IEM Penang Branch to ensure that IEM will continue to be the premier engineering society championing the adoption of ethics and professional best practices in all sectors of the industry.

Last year has been a challenging year and I am sure this year the very first half will be of a similar trend as well especially in organizing various activities like seminars, technical visits, and dialogue with the authorities. Resourceful engineers will always figure a way out of everything, and we have managed to organize various talks and events online and maybe in future to also conduct technical visit virtually.

I hope that all fellow members will continue to support the society even in circumstances that we no longer refer to as the new norm but the existing norm.

Do take care of yourself and stay safe.

Thank you very much.

Ir. Ong Sheng How

EDITORIAL NOTES

Welcome again to the Ingenieur Penang; The Bulletin of IEM Penang Branch. This year has been another difficult year for all of us due to the COVID-19 pandemic. Many of us have been affected in one way or another. We pray that everyone will stay safe and healthy.

We welcome the new team of the IEM Penang Branch Executive Committee for the session 2021/2022. IEM Penang members look forward to their unreserved and self-sacrificing service towards the engineering fraternity.

In Ingenieur Penang, we provide members with the latest updates of activities and events, news, technical papers, articles, reports, forums, announcements, advertisements, and other non-technical write-ups.

Now the publication of Ingenieur Penang comes only in the form of e-copies, in tandem with the present pandemic and also for environmental reasons.

We would also like to take this opportunity to announce to you that you can now advertise your companies / products in our Ingenieur Penang bulletin. For more information and the advertisement rates please contact our IEM Penang Branch secretariat office.

Last but not least, we welcome you to submit your technical or non-technical articles on any topic including leisure, adventures, poems, etc. for Ingenieur Penang's publication. You can email your piece to the IEM Penang Branch secretariat.

Progress development on:

Earthquake Design Considerations of Building Structures in Penang Island. A Collaborative Study Between IEM (Pg) / USM / UiTM

By Ir. Chua Beng Seong
Chair, Earthquake Engineering Sub-Committee

1.0 BACKGROUND INFORMATION

This is a brief report on the progress development of the collaboration work between IEM (Pg) / USM / UiTM on the above subject of study. The compressed format of the first report was published in the Issue No. 1/2020 of the INGENIUR PENANG.

As a recap, this study was undertaken in response to the request by the Datuk Bandar of MBPP for the IEM (Pg) to spearhead and undertake the detailed study on the high-rise structures with respect to the design submission requirement in Penang Island in view of the recent frequent tremors felt, which were caused by the strong earthquakes in Aceh, Sumatra.

2.0 OBJECTIVE

Based upon the hypothetical shapes of the test buildings, the study aims to derive a theoretical representation on the cost comparison of the Structure with respect to the building shapes that will be built and founded on the typical soft soil condition in the Penang Island.

The cost will be represented in terms of the theoretical quantity of concrete and reinforcement components as derived from the design to Eurocodes EC2 + EC1 versus EC2 + EC8 / MS EN 1998-1:2015.

At the same time, it is hoped that a clear guideline could be drawn on the effect of earthquake intensity (as per MS EN 1998: Malaysia National Annex to EC8) on the high-rise buildings in Penang Island with respect to the variable heights and shapes (Breadth / Depth) of the structures.

3.0 TERMS OF REFERENCE OF IEM (PG), USM & UiTM

IEM (Pg) will lead the Earthquake Subcommittee and will prepare the specifications & parameters for the model, building and structural properties.

IEM (Pg) will also provide technical support and training on the analysis and design requirements specifically to EC1, EC2 and EC8, to be carried out under the platforms of **ETABS** and **CSiDetail** numerical softwares.

The following Codes will be the basis of reference:

a. EC0 / EN1990: Basis of Structural Design
b. EC1 / EN1991 Part 1-4: Wind Actions on Structures
c. Wind Loadings for Building Structure
d. EC2 / EN1992: Concrete Structures General Rules
e. EC8 / EN1998 Part 1: Seismic Design General Rules
f. MS EN 1998: Malaysia National Annex to EC8

USM School of Civil Engineering & **UiTM** Faculty of Civil Engineering will provide the academic input and will supervise the final year (selected) students and to undertake the computational modelling, analysis & design of the test buildings as their final year project thesis.

4.0 BASIS OF COMPUTATIONAL MODELING

4.1 STRUCTURAL MODEL

A three-dimensional (spatial) structural model of a typical office building shall be generated as reference test building. The lift cores shall be

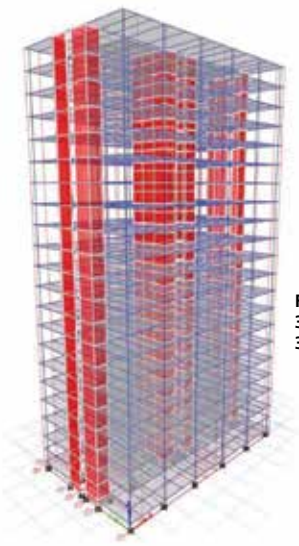

Fig. 1.0
3D View of 5 Bays x 3 Bays 20-Storey Model

located at the center while the staircase coupled shear walls shall be located at both ends of the building.

The test building shall be programed in such a way that the building plan will be expanded (in terms of no of bays) from a typical building regular in plan with slenderness of = Lxmax / Lymin = 1.67 (5 Bays x 3 Bays) to a slenderness of > 4 (max. 15 Bays x 3 Bays) in order to satisfy irregularity criteria in plan.

The proposed height of the test building shall be categorized into 10-Storey, 15-Storey, 20-Storey, 25-Storey, 30-Storey, 35-Storey & 40-Storey respectively.

Fig. 2.0 Typical Reference Floor Plan (Lymin. = 3-Bays: Lxmax. = 5 Bays)

4.2 OCCUPANT COMFORT REQUIREMENT

The test building will first be analyzed and checked based on EC2 + EC1 / MS1553 (Gk + Qk +WL) to ensure that the structural model satisfies a minimum occupant comfort requirement to ISO 10137. The Characteristic Acceleration, a ≤ 0.05 m/s^2 (equivalent to Natural Frequency, fn ≥ 0.5 Hz or Natural Period, T ≤ 2s at Fundamental Mode, T1) at the pen-ultimate floor under the 2 years return period of wind speed at V_2= 23.4 m/s shall be the basis of computation.

4.3 STATIC LIMIT STATE DESIGN

The same test building will then be analyzed and designed to EC2 + EC1 / MS1553 (Gk + Qk + WL) but with an upgrade of wind speed to V_{100} = 28.9 m/s under a 100-years return period.

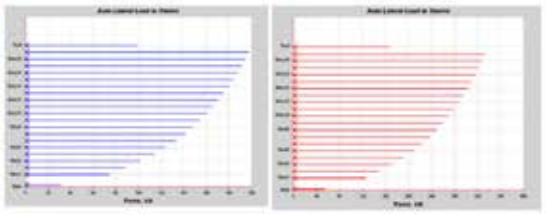

Fig.3.0 Reference 20-Storey Wind Force (kN): WLx & WLy

Under MS1553 CL.2.7.2, Total Displacement due to wind shall be limited to H/500 while the Inter Storey Drift shall be limited to hi/400 respectively.

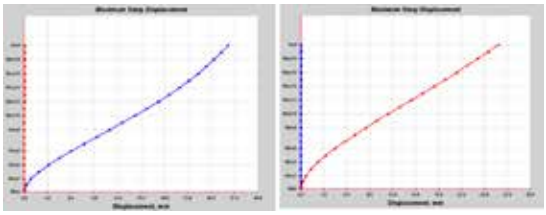

Fig.4.0 Reference 20-Storey Total Displacement (mm): Ux & Uy

4.4 SEISMIC LIMIT STATE DESIGN

The same test building shall finally be analyzed and designed to EC8 / MS EN 1998-1:2015 based on Modal Response Spectrum Analysis (Dynamic Linear Elastic) where the Design Spectrum in both the horizontal directions shall be generated based on:

- Elastic Response Spectrum (Annex C Fig C. of MS EN 1998-1:20150);
- Reference Peak Ground Acceleration: a_{gR}= 0.05g; (Annex B)
- Design Peak Ground Acceleration: a_g = 0.06g;

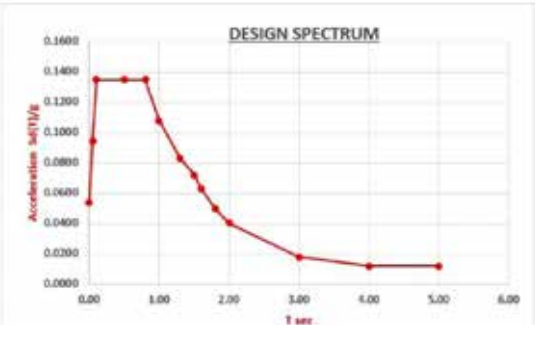

Fig. 5.0 Design Spectrum (a_g = 0.06g)

- Other seismic action and criteria such as Importance Factor (γ_1=1.2), Ground Profiles (Type D), Soil Factor (S = 1.35 for soil deposit > 30m), Upper Limit Behavior Factor (q = 1.5) & Ductility Class Low shall be the basis.
- Elastic flexural, Shear & Torsional stiffness of cracked elements shall be 50% of uncracked elements as per EC8 CL.4.3.1. Torsional stiffness of cracked section for Beams & Slabs shall be further reduced to 10% of uncracked section.
- Inter-Storey Drift shall be limited to 0.0075h as per EC8 CL.4.4.3.2.

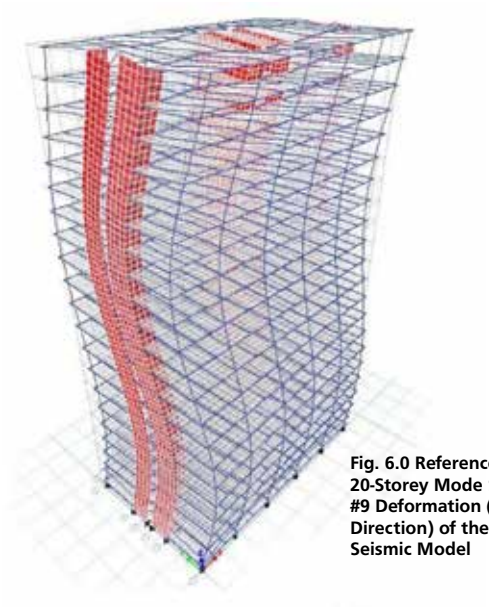

Fig. 6.0 Reference 20-Storey Mode Shape #9 Deformation (Uy Direction) of the Seismic Model

4.5 GENERAL MODAL & LOAD CASE

4.5.1 Floor Diaphragm

Floor Diaphragm shall be Rigid Thin Shell and Torsional Eccentricity Ratio (X, Y) of the Diaphragm shall be 0.05.

4.5.2 Shell Meshing

Shell meshing for slab and Wall shall be set at 1.0m grid.

4.5.3 Modal Damping

Modal damping constant shall be set at 0.05 or 5.0%.

4.5.4 Model Combination Method

The CQC (Complete Quadratic Combination) rule for the combination of different modes shall comply to EC8 CL.4.3.3.3.2.

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4.5.5 Model Directional Combination Type

SRSS (Square Root of the Sum of the squared values) shall comply to EC8 CL.4.3.3.5.1.

4.5.6 Modal Mass Participation

Target Modal Mass Participation Ratio (SumUx, SumUy, SumRz) for the Modal case iterations (Eigen Sub Type) shall be set at 90.0% as per EC8 CL.4.3.3.1.

4.5.7 P-Delta

P-Delta option shall be set based on Mass and non-iterative.

4.5.8 Geometric Imperfection

Global imperfections shall be accounted for in the design stage as ECC (eccentricity) on isolated vertical members as per EC2 CL.5.2.

5.0 LOAD COMBINATION

The design load combinations are the various combinations of the load cases for which the structure needs to be checked.

5.1 (Gk + Qk + WL) Combination

For the Ultimate Limit State (ULS) Analysis & Design to EC2 + EC1 / MS1553 (Gk + Qk + WL), Eurocode 0-2002 allows the load combinations to be defined based on EC0 Eqn. 6.10 or the less favorable of EC0 Eqn. 6.10a and Eqm.6.10b.

$$\gamma \quad \gamma_{G,j} \cdot G_{k,j} + \gamma_{Q,1} \cdot Q_{k,1} + \sum \gamma_{Q,I} \cdot \Psi_{0,I} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.10}$$

$$\gamma_{G,j} \cdot G_{k,j} + \gamma_{Q,1} \cdot \Psi_{0,1} \cdot Q_{k,1} + \sum \gamma_{Q,I} \cdot \Psi_{0,I} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.10a}$$

$$\xi \cdot \gamma_{G,j} \cdot G_{k,j} + \gamma_{Q,1} \cdot Q_{k,1} + \sum \gamma_{Q,I} \cdot \Psi_{0,I} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.10b}$$

For Service Limit State (SLS) Analysis & Design, the load combinations to be defined based on EC0 Eqn.6.14b or the less favorable of EC0 Eqn. 6.15b and Eqm.6.16b.

$$G_{k,j} + Q_{k,1} + \sum \Psi_{0,i} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.14b}$$

$$G_{k,j} + \Psi_{1,1} \cdot Q_{k,1} + \sum \Psi_{2,i} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.15b}$$

$$G_{k,j} + \sum \Psi_{2,i} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.16b}$$

5.2 (Gk + Qk + EQ) Combination

For the Ultimate Limit State Analysis & Design to EC8 / MS EN 1998-1:2015, EC0 Eqn.6.10 and Eqn. 6.12b shall be applied.

$$\gamma_{G,j} \cdot G_{k,j} + \gamma_{Q,1} \cdot Q_{k,1} + \sum \gamma_{Q,I} \cdot \Psi_{0,I} \cdot Q_{k,I} \qquad \textbf{Eqn. 6.10}$$

$$G_{k,j} + \sum \Psi_{2,i} \cdot Q_{k,i} + \gamma_I \cdot A_{Ek} \qquad \textbf{Eqn. 6.12b}$$

For Service Limit State Analysis & Design, the load combinations to be defined based on EC0 Eqn. 6.16b.

$$G_{k,j} + \sum \Psi_{2,i} \cdot Q_{k,i} \text{ (or } A_{Ek}) \qquad \textbf{Eqn. 6.16b}$$

6.0 SCHEDULES OF QUANTITY

Reinforced concrete schedules for rebar and concrete quantities shall be automated and computed with reference to the rebar and concrete schedules generated under the **CSiDetail** platform.

Comparison will then be made between the design output from (Gk + Qk + WL) verses (Gk + Qk + EQ) load combinations.

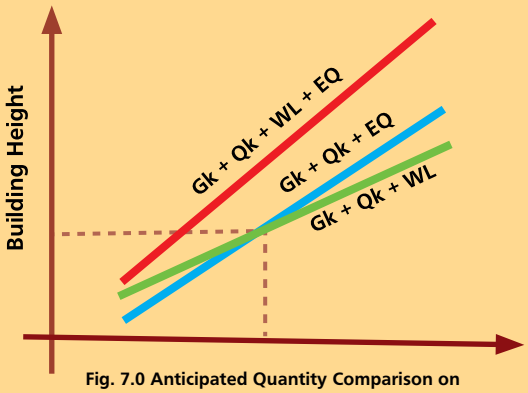

Fig. 7.0 Anticipated Quantity Comparison on Building Height vs λ

7.0 CONCLUDING REMARKS

The collaborative study between IEM (Pg) / USM / UiTM is currently in its second-year phase.

The second phase involves common software platforms to be used i.e., **ETABS** and **CSiDetail**. Consistency checks on the various stages of the study were drawn up to ensure that all steps (from Specifications, Modelling, Analysis, Design & Detailing Parameters) shall be strictly adhered to, by the students from both universities.

As the study will involve large number of computational modelling works, we do not envisage the second phase of the study to be ready within a short period of time. However, IEM (Pg) / Earthquake Engineering Standing Sub-Committee will continue to update on the progress development through the INGENIEUR PENANG Bulletin from time to time.

54th ANNUAL GENERAL MEETING

By Ir. Teh Siew Yin

Left to Right: Ir. Dr. Leo Choe Peng, Ir. Teh Siew Yin, Ir. Darren Khoo Jun Chieh, President Ir. Ong Ching Loon, Ir. Bernard Lim Kee Weng, Ir. Chan Wah Cheong, Ir. Tean Sze Nee.

The 54th Annual General Meeting was held at the Secretariat in E-Gate at 6:00 p.m. and was adjourned at 7:00 p.m. on 26th of March 2021. The meeting was attended physically by a few key newly elected executive committee members as well as a couple of committee members from previous year. Due to the travel restriction and the enforcement of the Standard Operating Procedure put in place by the Government, members including the rest of the committee members participated in this AGM via online platform Zoom. A total of 142 members attended this AGM.

Immediate Past Chairman, Ir. Yau Ann Nian, apologized for his absence. His message and regards were conveyed by past Honorary Secretary Ir. Dr. Leo Choe Peng. It was an honor to welcome and have our President Ir. Ong Ching Loon from the IEM Headquarters to give us a message in person.

The minutes of 53rd Annual General Meeting held on 14th of March 2020 was presented by Honorary Secretary Ir. Dr. Leo Choe Peng and confirmed by Ir. Khaw Yao Shun and Ir. Bhuvendhran Rudrusamy.

IEM Penang Branch consists of 2292 members as at 31st of December 2020. Despite the pandemic, IEM Penang Branch managed to carry out some events, mostly online seminars to achieve adequate CPD hours during Session 2020/2021. Some of the events include workshops, technical visits, recruitment drives in universities, meetings with the Authorities and corporate social responsibility to at least 3 organizations. In addition, our Professional Interviewers managed to complete 27 interviews out of 33 applications received in 2020.

The report and financial statement for year ended on 31st of December 2020 was audited internally by Ir. Ooi Boon Bow and Ir. Thong Cheong Tai and presented by Honorary Treasurer Ir. Tean Sze Nee. The deficit of RM139,189 was mainly due to a decline in income generated from seminars and cancellation of Annual Dinner due to the rising Covid-19 cases at that time. Ir. Marcus Lim Eu Sheng proposed to close the account and the proposal was seconded by Ir. Ng Jun Ming. Ir. Ting Chek Choon proposed Ir. Ooi Boon Bow as the Internal Auditor again for the next session 2021/2022 and the proposal was seconded by Ir. Ong Sheng How. Ir. Dr. Mui Kai Yin proposed Ir. Thong Chong Tai to be another Internal Auditor and the proposal was seconded by Ir. Lee Choo Yong.

Members from YES who assisted the Secretariat to run a successful online AGM. Left to Right: Elwin Heng Chia Jie, Ir. Cheah Sheng Hong, President Ir. Ong Ching Loon, Low Chung Kitt, Loo Xuyan.

Dato' Ir. Dr. Goh Teik Cheong was selected in 2020 to receive the Distinguished Engineer Award for that year and will present a talk about his career and achievements as soon as physical attendance is permitted.

COVID-19 pandemic has resulted in a drop in physical attendance for the past two consecutive AGMs. Julie from the Secretariat has been conscientiously ensuring uninterrupted and good quality screening of video and audio sessions for ZOOM online meetings.

Behind the Scene at the Secretariat office. From left to right: Secretariat Wendy Lim Mee Pek along with YES members answering phone calls and assisting members during online AGM.

The newly elected Chairman Ir. Bernard Lim Kee Weng congratulated and welcomed all the newly elected executive committee members and look forward to working with all the committee members to serve our members, the institution and our society. He also presented his strategic goals for the institution. The guidelines are as follows:

- To position the IEM as an essential technical hub for Penang
- More collaboration with other bodies i.e. Government and Non-Government
- Organize more activities i.e. talks, webinars, seminars, technical visits, etc.
- Improve channels of communication with members
- Increase members engagement

Ir. Bernard Lim wishes to achieve these objectives together with the team during his tenure.

IEM Penang Branch Executive Committee Session 2021-2022

Ir. Bernard Lim
Chairman

Ir. Yau Ann Nian
Immediate Past Chairman

Ir. Heng Lee Sun
Vice Chairman

Ir. Chan Wah Cheong
Vice Chairman

Ir. Darren Khoo
Honorary Treasurer

Ir. Teh Siew Yin
Honorary Secretary

8 Ordinary Committee Members

Ir. Dr. Yee Hooi Min

Ir. Dr. Khor Jeen Ghee

Ir. Fong Choon Fuoi

Ir. Lian Shin Wai, Andy

Ir. Catherine Sim Siew Ping

Ir. Dr. Chang Chun Kiat

Ir. Ong Sheng How

Ir. Tean Sze Nee

Young Engineers Section (YES) Annual General Meeting

By Mr. Low Chung Kitt
Chairman, YES (Pg)

By Mr. Lim Wei Hong
Vice-Chairman, YES (Pg)

The Institution of Engineers Malaysia, Young Engineers Section (Penang Branch) conducted the IEM YES Penang Annual General Meeting (AGM) 2020 on the 12th of December, 2020 at 9:00 a.m. through Zoom Online Platform. All IEM Graduate & Students Members from Penang were invited to take part.

The meeting started sharp at 9:00 a.m., with the IEM YES Penang Chairman Session 2019/2020, Ir. Ts. Wong Kok Nian summarizing the activities conducted in the year 2019/2020, and addressing his appreciation to the efforts and contributions by all members to make each and every event successful.

A new committee line-up for the term 2020/2021 was formed in line with the by-laws requirements with the basis of online voting for proposed and seconded candidates, for all positions in the committee line-up. All selected candidates were provided with equal opportunities to promote themselves and how they could contribute to the organization and community when elected. The newly elected chairman for the IEM YES (Penang) in the term 2020/21 is Mr. Low Chung Kitt, and his committee line-up is as shown in the next column.

IEM Penang Branch former Chairman (current Immediate Past Chairman), Ir. Yau Ann Nian and former Vice Chairman (current Chairman), Ir. Bernard also attended the AGM on behalf of the executive committee. The AGM adjourned at 12:00 p.m. with group photos for all participants.

Photo 1.0: Group Photo with Ir. Bernard Lim
From Left To Right: Ir. Ts. Dr. Tan Kim Seah, Ir. Ts. Wong Kok Nian, Ir. Bernard Lim, Ts. Low Chung Kitt, Ir. Tan Chee Hsiang (Darren), Ir. Ts. Cheah Sheng Hong

YES (Penang) Committee Members Session 2020/2021	
Chairman	Low Chung Kitt
Vice Chairman 1	Sim Kai Sheng
Vice Chairman 2	Lim Wei Hong
Hon. Secretary / Treasurer	Mohammad Azrul bin Mat Zahir
Immediate Past Chairman	Ir. Ts. Wong Kok Nian
Past Chairman	Loh Kwan Jou Ir. Ts. Lim Juin Khye
General Committee Member	Tan U-Shang Phuah Yong Zhen Loo Xuyan Lim Jing Wei (George) Mok Zhen Yick Goh Wei Loon Goh Shing Yi Lim Wei Hang

Women Engineers Section (WE)

Women Engineers (WE) Committee Members Session 2021/2022	
Chairlady	Ir. Tan Yan Moy
Vice Chairlady	Ir. Ooi Choy Hoong
Secretary / Treasurer	Ir. Dr. Leo Choe Peng
Immediate Past Chairlady	Ir. Heng Lee Sun
Past Chairlady	Ir. Tean Sze Nee
Committee Members	
Professional Development, Mentoring (PDM)	Ir. Yeap Geok Ngoh Ir. Lim Sheau Rou
Technical Talk / Visit (TTV)	Ir. Catherine Sim Ms. Chan York Lin
Membership Recruitment, Career Talk (MCT)	Ir. Dr. Leo Choe Peng Ir. Dr. Yee Hooi Min
Corporate Social Responsibility (CSR)	Ms. Tan Hui Sze Ms. Loh Yee Teng
Networking & Leisure (NNL)	Ir. Ooi Choy Hoong Ir. Ang Hooi Pheng
WE Conference (WEC)	Ir. Heng Lee Sun Ir. Sophia Than

COVID-19 CHARITY DRIVE

FOR PENANG GENERAL HOSPITAL (18th – 25th May 2021)

On behalf of the IEM (Penang Branch), we would like to express our sincere thanks to the donors for their kind contribution towards our IEM Penang COVID19 Charity Drive. We are glad to inform that we have successfully collected a total sum of RM25,250 during the 8 days of our campaign!

Our aim is to help medical frontliners in Penang in their effort to combat Covid-19. With the help of generous members, we have managed to contribute one (1) unit of Humidifier and some medical supplies to Penang General Hospital.

On 3rd August 2021, this hospital had to close its Outpatient Department so as to temporarily convert it into an observation and initial treatment ward for Covid-19 patients. Our timely action helped them to be more prepared for the surge in Covid-19 cases.

One set of humidifier and 4 cartons of face masks were delivered to Penang General Hospital by Ir. Bernard Lim (Chairman), Ir. Chan Wah Cheong (Vice Chairman) and Mr. Asrul Mat Zahir (Member of Young Engineers Section) on 17th June 2021.

Once again, thank you very much for making a difference in the hearts of those you have touched!

With gratitude,

Ir. BERNARD LIM KEE WENG
Chairman, IEM Penang Branch

NEW MEMBERSHIP GRADE LAUNCHING

By Ir. Dr. Tan Kim Seah

On 3 April 2021, IEM has officially launched four new grades of membership as we move to embrace the whole engineering fraternity into our fold. The engineering family comprises of the whole chain of technical personnel involved in bringing a technical concept into fruition. While the engineers create the design, engineering technologists and engineering technicians are the technical personnel who are responsible to bring design into fruition by systematic planning and implementation of design, as well as taking care of operation, supervision, testing, troubleshooting and maintenance of relevant engineering works.

Four new grades of membership shall register under Non-Corporate Members of IEM as prescribed in the latest amendment of IEM Constitutions and By-Laws. A candidate for admission or transfer into these new grades of membership shall produce evidence to the satisfaction of the Council based on general requirements as follows:

i) Engineering Technologist Graduate Member
(Grad E.T.I.E.M.)

- An accredited engineering technology degree, and
- A registered Engineering Technologist with BEM.

ii) Engineering Technologist Member (E.T.I.E.M.)

- An accredited engineering technology degree,
- A registered Engineering Technologist with BEM,
- Minimum 3 years of relevant practical experience,
- The experience should be in planning, implementing, management, operation, and maintenance of such works as are comprised within the profession of an engineering technologist, and
- Passed Technologist Competence Assessment

iii) Engineering Technician Graduate Member
(Grad. E.Tn.I.E.M.)

- An accredited engineering diploma.

iv) Engineering Technician Member (E.Tn.I.E.M.)

- An accredited engineering diploma,
- Registered with BEM as an Inspector of Works (IOW),
- Minimum 3 years of relevant practical experience, and
- The experience should be in supervision, operation and maintenance of such works as are comprised within the profession of an engineering technician, and
- Passed Technician Competence Assessment

Reference:

i. *IEM Constitutions, posted on 27 April 2021, available online at https://www.myiem.org.my/content/constitution-253.aspx*

ii. *IEM By-Laws, posted on 27 April 2021, available online at https://www.myiem.org.my/content/bylaws-254.aspx*

iii. *Launching Ceremony for Engineering Technologists and Engineering Technicians, available online at https://www.myiem.org.my/events/eventregistration.aspx?id=17446*

INTERACTIVE BLENDED LEARNING TOOL IN DYNAMICS ENGINEERING

Associate Professor Ir. Dr. Yee Hooi Min and Noor Azura Binti Ab. Salim

Technology can be used to provide an active and flexible learning environment. There is a consensus that existing and emerging digital technologies have the potential to expand the reach and effectiveness of current educational tools. Blended Learning involve in the vast used of technology for teaching and learning. Blended Learning has already started and is engaged to stick with the modern education plan. This article is to propose an interactive learning tool in Blended Learning for Dynamics Engineering. In the early 1980's, incorporating technology in the classroom emerged as an issue for both lecturers and students. Weaver and Nilson (2005) mentioned that computers and other digital technologies that allow wireless access to the internet have become standard technologies in education. Rutten et al. (2011) stated that increasing availability of computers and related equipment such as mobile devices and smartboards have become available for science subjects. It has led to simulations becoming an integral part of many science curricula. Researchers have studied on how technology is used in the classroom, advantages and disadvantages of technology in the classroom may hold for lecturers and students. In general, there is a consensus that existing and emerging digital technologies have the potential to expand the reach and effectiveness of current Engineering educational tools.

The proposed interactive learning tool can be used to provide an active and flexible learning environment. In this paper, Intuiface Composer is used while Microsoft Paint is used to edit the images that is being inserted into the Intuiface Composer. This Intuiface Composer can create amazing interactive experiences in order to build interactive, expressive and connected digital experiences without any coding. This tool can express creativity in user experiences built specifically for interactivity without the need to write a line of code. Furthermore, it can also create own images, videos, documents, websites, 3D models and others which are automatically interactive. It can work with any type of input device. It can run on iPad, Android, Samsung SSP or Windows-driven touch displays of any size, shape or manufacturer. It can even be deployed to multi-display walls.

Figure 1 shows one of the content of Dynamics Engineering in Intuiface Composer based on Beer et al. (2013). It enables users or learners to quickly access the information when needed. It can create a more relax classroom environment. The interactive learning in the classroom is able to help students to be well prepared to become an Engineer to solve the Engineering complex problem.

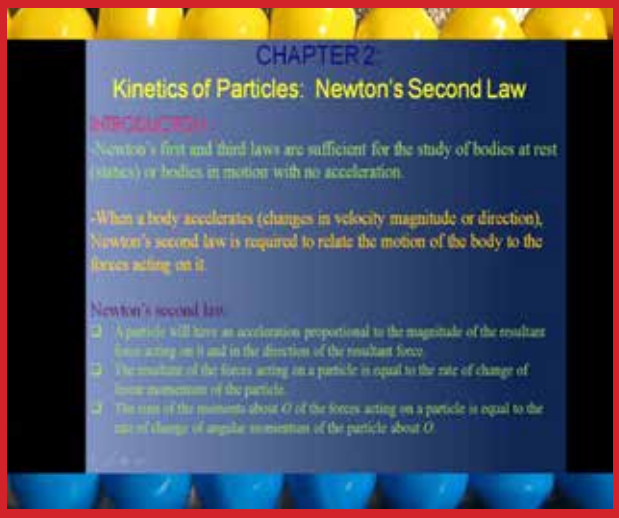

Figure 1: Dynamics topic

The results of interactive learning tool can serve as a reference for proper selection of Blended Learning and Teaching portal for better achievement of Engineering students. This proposed interactive learning tools are able to enhance the understanding of students about the Dynamics Engineering courses. Students can easily to solve the Engineering problem when become an Engineer.

References

Weaver, B. E. and Nilson, L. B. (2005) Laptops in class: what are they good for? What can you do with them? New Directions for Teaching and Learning, Vol. 101, p. 3-13.

Rutten, N., Joolingen, W.R.V. and Veen, J.T.V. (2011) The learning effects of computer simulations in science education. Computers and Education, Vol. 58, p. 136-153.

Beer, F.P., Johnson Jr., E.R., Mazurek, D. & Cornwell, P. (2013). Vector Mechanics for Engineers: Dynamics. Tenth Edition in SI Unit, McGraw-Hill.

Intuiface Composer (Free edition) www.intuiface.com (2019)

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MEETING WITH PRESIDENT Ir. ONG CHING LOON

By Ir. Teh Siew Yin

The first meeting between the Executive Committee members for session 2021/2022 and the President Ir. Ong Ching Loon was held on 26th of March 2021 at the Secretariat in E-Gate at 3:00 p.m. and adjourned at 4:30 p.m.

By convention, this meeting is normally conducted before the Annual General Meeting to provide the President with the latest updates on matters concerning our Penang branch. Our activities especially the seminars and annual dinner that have usually been able to generate income to sustain the functions of our organization have been greatly hampered by the Covid-19 pandemic for a year now. Unfortunately, the situation may continue to adversely affect the financial standing of the organization until such a time when the pandemic is over. We have been advised by the Headquarters to cancel the annual dinner until further notice. We have also switched to online seminars with discounted registration fee instead of our customary physical seminars.

Ir. Bernard Lim also updated the President on the latest Majlis Bandaraya Pulau Pinang (MBPP) ruling on Traffic Impact Assessment (TIA) for projects, and he has also sought the IEM Headquarters' advice. This issue of traffic has cropped up due to the public outcry over traffic congestion that has become problematic. Henceforth, the Council has appointed an independent checker to resolve all concerns and to improve the system.

Ir. Bernard Lim presented some photographs of the activities from previous years i.e. seminars, workshops, technical visits, recruitment drives in universities, meetings with the Authorities and corporate social responsibility to at least 3 organizations.

Ir. Bernard Lim also briefed the President on the background of office bearers of the Executive Committee and their respective work experience for the upcoming session 2021/2022. He also shared his 5 strategic goals for the IEM Penang Branch, and he hopes to achieve them together with the team during his tenure.

Our members have been complaining about their confusion over the scarce and unclear information provided especially regarding commencement of work during the Covid-19 pandemic by various government departments i.e. Ministry of Health (KKM), City Councils (MBPP), National Security Council (MKN), Construction Industry Development Board (CIDB) and etc. Members hope for a more centralized channel to collate and coordinate all the information given by various departments and create a simple and concise portal to share especially amongst those who are in our engineering and construction industries.

COURTESY VISIT TO

THE PENANG CHIEF MINISTER YAB TUAN CHOW KON YEOW

ON 23 APRIL 2021

By Ir. Bernard Lim

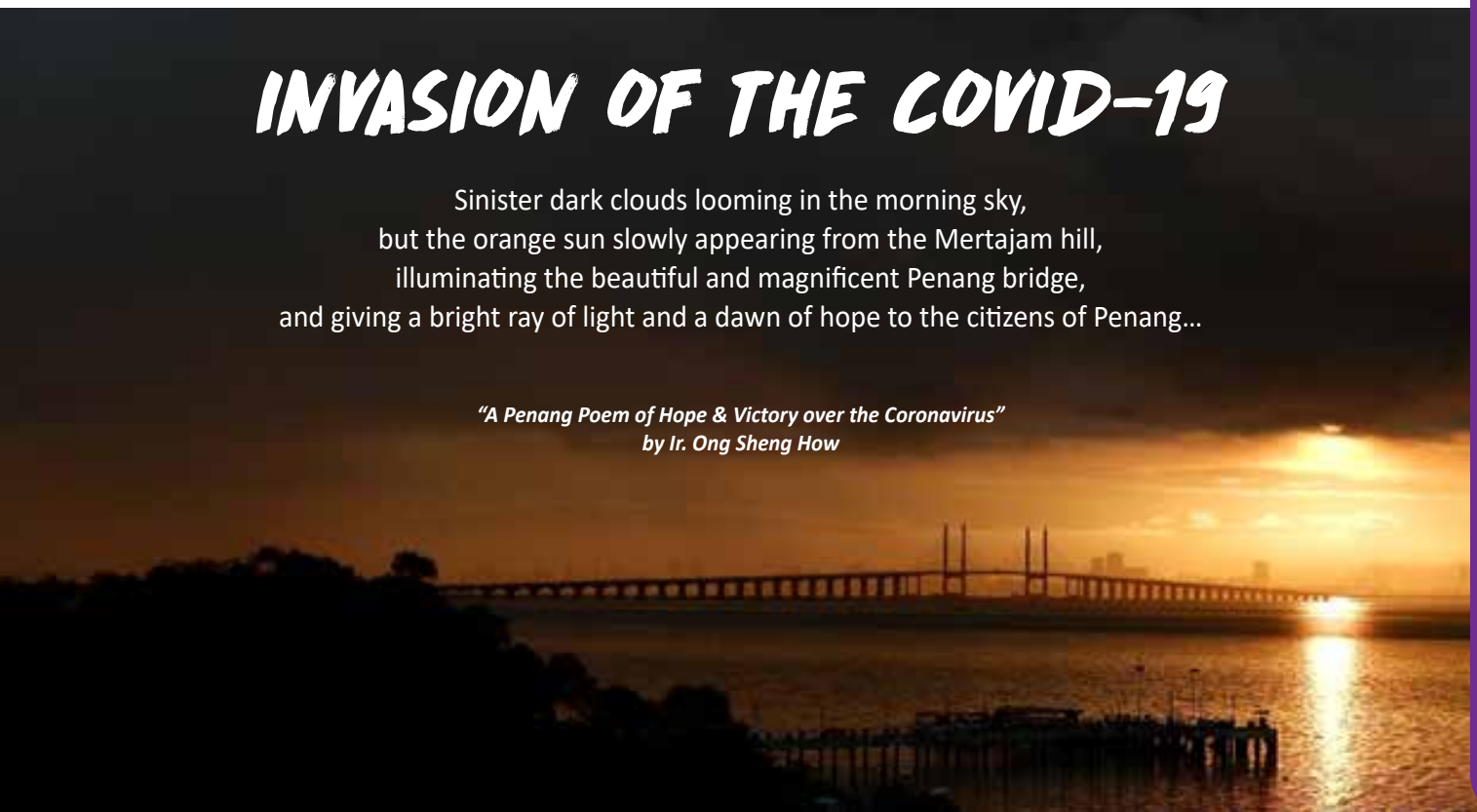
" IEM Penang Ready to Serve "

IEM Penang Branch Chairman, Ir Bernard Lim together with its newly elected committee members paid a courtesy visit to Penang Chief Minister YAB Tuan Chow Kon Yeow on 23 April 2021. The IEM National President, Ir. Ong Ching Loon was also present and was grateful to be given an opportunity to exchange views with him.

I presented to YAB Tuan Chow the newly line up of IEM Committee Members and mentioned that all of us were ready to serve by providing technical support to the state and its relevant agencies. I had also explained that IEM had publish various technical papers, publish code of practices, organize technical symposium and talks, and actively engaged with the local authorities. Our responsibility was to promote the engineering profession and facilitate engineering views and ideas. I hope that we could work with the state and attain great achievements together. Another area that IEM could help the state government was in the area of human capital.

YAB Tuan Chow ended by mentioning the need for the state of Penang to place an importance on STEM (Science, Technology, Engineering, Mathematics) and he hopes the stronger corporation between the state government and IEM Penang Branch would bring fruitful outcome.

The courtesy call ended by me presenting a plaque to YAB Tuan Chow in the presence of our IEM President, Ir. Ong.



INVASION OF THE COVID-19

Sinister dark clouds looming in the morning sky,
but the orange sun slowly appearing from the Mertajam hill,
illuminating the beautiful and magnificent Penang bridge,
and giving a bright ray of light and a dawn of hope to the citizens of Penang...

"A Penang Poem of Hope & Victory over the Coronavirus"
by Ir. Ong Sheng How

COURTESY VISIT TO PBAPP

By Ir. Tean Sze Nee

A team of 4 members led by Chairman, Ir. Bernard Lim from IEM Penang Branch made a courtesy visit to PBAPP head office at Komtar on 6 April 2021. During the visit, Chairman Ir. Bernard Lim shared IEM Penang Branch vision and mission and also discussed on how IEM Penang, as a professional body could further contribute to Penang's water industry development.

CEO PBA, Dato' Ir. Jaseni Maidinsa shared PBA's newly launched 3rd submarine pipelines and expansion of Mengkuang Dam to ensure coping with increasing water demand in the state. Dato' Jaseni also shared other Penang state Water Supply contingency plans due to the delay of Sungai Perak Raw Water Transfer Scheme (SPRWTS) in supplying raw water to Penang state.

Dato' Jaseni highlighted that during this public health crisis (Covid-19 Pandemic) the sustenance of continuous water supply was an issue of paramount importance, although this was rarely discussed publicly. Millions of people, many of whom had to stay home to stay safe from Covid-19, needed water to drink, cook, wash, clean and bath daily. Thousands of organizations needed water to function normally and safely. Accordingly, PBAPP strived faithfully to ensure continuous water supply services in Penang.

To cope with future water demand, the state should focus on sourcing raw water and reviewing water tariff so that it could reflect the actual cost. In 2020, the threat of logging activities in Ulu Muda also re-emerged, and was worsen by a proposal to initiate rare earth elements (REE) mining operations in the most important water catchment area in Malaysia's Northern Corridor Economic Region (NCER) where more than 80% of Penang state raw water source come from PBAPP spoke up, calling on federal government to stop and ban logging and mining to avoid disaster and water crisis.

PBAPP is the licensed water operator in Penang but in reality, in 2020, PBAPP fundamentally shouldered the responsibility of protecting the people's water supply in Penang, 24/7, in the face of climate change and a raging Covid-19 pandemic.

It was a fruitful sharing session and the visit lasted around 1.5 hour.

COURTESY CALL BY IEM Penang Branch to **CIDB Penang** and **Bomba Batu Kawan**

By Ir. Catherine Sim Siew Ping

The Institute of Engineers Malaysia (IEM) Penang Branch executive committees paid courtesy calls to Tuan Zahidi bin Hashim, Pengarah of the Construction Industry Development Board (CIDB) Malaysia, Penang on 21st April 2021, and YS PKPjB Saadon bin Moktar, Pengarah of Bomba Batu Kawan, Penang on 6th May 2021.

Ir. Bernard Lim, the Chairman of IEM Penang Branch 2021/2022 shared that the Penang Branch was ready to serve and provide technical support to CIDB and Bomba. The IEM Penang Branch has offered its expertise to bring the state to greater heights.

Total membership of the IEM Penang Branch as at December 2020 was 2,292 members, with 51 events being carried out throughout year 2020 and a total of 110 cumulative Continuous Professional Development (CPD) hours achieved.

The IEM Technical Sub-committees inclusive of Geotechincal Engineering, Mechanical and Electrical Engineering, Civil and Structural Engineering, Earthquake Engineering, Water Resources and Hydrology Engineering, Electronic Engineering, Material Engineering, Professional Practices Sub-Committee, Manufacturing Sub-Committee.

IEM's representations in Penang State encompasses Technical Review Panel (TRP), Penang Hill Advisory Panel, Georgetown World Heritage, Majlis Bandaraya Pulau Pinang and Majlis Bandaraya Seberang Perai Surveyor, Planners, Engineers, Architect, Developer (SPEAD), Penang Green Council, and Dengue Prevention Sub-committee.

From left, IEM Penang Branch – Ir. Teh Siew Yin, Ir. Catherine Sim, Ir. Chan Wah Cheong, Ir. Bernard Lim; Bomba Batu Kawan, Penang – YS PKPjB Saadon bin Moktar, Tuan Yusri, Tuan Faizal, Tuan Johari, Tuan Nazri.

Activities like Professional Interviews, Technical Talks in the form of Webinars (especially throughout this pandemic period), Engineering Week, Membership Recruitment, Corporate Social Responsibility, University and Schools Collaborations, Activities Promoting Science, Technology, Education and Mathematics (STEM) Initiatives, Young Engineer Section (YES), Women Engineer Section, Newsletter publication continue to be organised throughout the year.

Strategic goals of IEM Penang Branch such as to position IEM as an essential technical hub for Penang; to impose more collaboration with bodies, be it government and non-government bodies; to organise more activities; to improve communication mode among members; and to increase members engagement.

From left, IEM Penang Branch – Ir. Andy Lian, Ir. Catherine Sim, Ir. Teh Siew Yin, Ir. Bernard Lim; CIDB Malaysia, Penang Branch – Tuan Zahidi, Tuan Rizat, Puan Mashita.

It was shared to both CIDB Penang and Bomba Batu Kawan that collaboration on technical talks, workshops and symposiums could be jointly organised with IEM Penang Branch and if required, IEM Penang Branch is ready to collaborate to jointly develop best engineering practice guides.

Ir. Bernard Lim shared about the launching of new membership grades, namely, Engineering Technologist Graduate Member as well as Engineering Technologist Member. This membership enables technicians across all engineering disciplines to be part of the institution member.

COURTESY VISIT TO GEORGE TOWN WORLD HERITAGE INCORPORATED (GTWHI)

By Ir. Teh Siew Yin

The GTWHI office was undergoing repair and restoration works during our visit on 28th April 2021. Hence, the function was relocated to the GTWHI Resource Centre at Armenian Street Heritage Hotel. This temporary office has limited space and could only accommodate 2 visitors at a time during Covid-19 pandemic. Ir. Bernard Lim and Ir. Teh Siew Yin attended physically whilst Ir. Chan Wah Cheong and Ir. Ong Sheng How attended via zoom. The General Manager of GTWHI, Dr. Ang Ming Chee was briefed on our IEM's mission for the year and she expressed her readiness to collaborate with us. Amongst the items discussed were:

Memorandum of Understanding

We will be signing the MoU with GTWHI soon.

Notification of Seminars / Talks

Even though the seminars or talks conducted by GTWHI may not fetch any CPD points for renewal of our professional engineering license, they will serve as the first step to understanding and appreciation of our Penang heritage and culture. This will eventually result in a better design for the heritage building and its structure.

George Town Special Area Plan

We were requested to assist them in reviewing the final draft for the second edition of the Special Area Plan which will be due for publication in year 2022. IEM Penang Branch would like to form a subcommittee to assist our George Town Heritage group in research and new proposals for improvement of buildings and public areas in the heritage enclave.

From left to right: Josephine Jalleh, Dr. Ang Ming Chee, Ng Boon Nee, Muhammad Hijas Sahari, Ir. Bernard Lim & Ir. Teh Siew Yin (Photo courtesy of GTWHI)

Vacancy for Engineer

GTWHI has been looking for a full time Civil Engineer. Training will be provided to the successful candidate who will not only be required to be very knowledgable in Civil Engineering but also to possess the passion to conserve George Town's heritage and culture.

Heritage Book Souvenir

We are very grateful to receive the following books from them and welcome our members to enjoy reading them in our office:

George Town Rancangan Kawasan Khas (Special Area Plan) – a guideline for design

Penang at a Glance by George Town Festival

City Eye Magazine – About Penang & its heritage

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We are pleased to inform you that IEM Penang Branch will be publishing the next news bulletin named **Ingenieur Penang in December 2021**.

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We are hopeful that you will find this useful and will consider advertising with us. Kindly tick on the box in the form and return it to IEM Penang branch office together with the bank-in slip. Alternatively, you can scan and email to the person who has contacted you.

Thank you.
Yours sincerely

Ir. Bernard Lim Kee Weng
Chairman
IEM (Penang Branch)

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- Academic institutions i.e. universities, secondary schools, etc.
- Professional institutions i.e. universities, secondary schools, etc.
- Our sponsors / advertisers i.e. Developers, Contractors, companies involved in engineering related products & services, etc.

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The electronic soft copy bulletin will be:

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- Posted in the IEM Penang Branch's web site which is accessible to not just its own 2200 members but the public as well.
- Nicely formatted in color on A4 size papers for Client's printing, distribution and keepsake.

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