THE HONG KONG INSTITUTION OF ENGINEERS 香港工程師學會

# Structural Division



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## Committee Members 2020/2021



Ir LAM King-kong Chairman Hospital Authority

#### Ir Prof Ben YOUNG

*Immediate Past Chairman* The Hong Kong Polytechnic University

Ir Ben TSE Wai-keung Deputy Chairman BEN TSE & Associates Ltd.

#### Ir Albert A Ray TAM Hon Secretary

Buildings Department

Ir Kevin TANG Hon Treasurer Greg Wong & Associates Ltd.

Ir CHIN Sai-ping Committee Member Aurecon

#### Ir Dr Paul LAM Heung-fai

Committee Member Department of Architecture and Civil Engineering, City University of Hong Kong

#### Ir Hammus CHUI Wai-ming

Committee Member Housing Department

#### Ir LIN Siu-man

Committee Member West Kowloon Cultural District Authority

#### Ir Jacky CHIONG Kam-yueng

*Committee Member* The Hong Kong Polytechnic University

#### Ir Prof LO Sai-huen

Committee Member Department of Civil Engineering, The University of Hong Kong

#### Ir Dr Simon WONG Ho-fai

Committee Member Faculty of Science and Technology Technological and Higher Education Institute of Hong Kong

Ir CHAN Chi-kong Committee Member Arcadis

Ir Kenneth CHAN Wai-yee Committee Member Highways Department

#### Ir Simon WONG Kin-kwok

Committee Member Architectural Services Department

#### Ir Patrick HOU Man-wai

Committee Member Gammon Construction Limited

#### Ir Prof CHAN Chun-man

Committee Member Department of Civil and Environmental Engineering, The Hong Kong University of Science and Technology

#### Ir Jesse CHAN Hiu-tung

*Committee Member* Arcadis

#### Ir Robert LAM Siu-hung

*Committee Member* Sun Hung Kai Properties Ltd.

#### Ir Jenny LAU Ching-ling

Committee Member Architectural Services Department

#### Mr Simon PANG Hin-lam

Ex-officio Member (AMC Representative) Arcadis

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#### Ir Dr Joseph CHI Wuh-jian

Ex-officio Member (SSC Representative) Canwest Consultant Ltd.

#### Ir WONG Hei-long, Ken

Ex-officio Member (YMC Representative) Civil Engineering and Development Department

#### Ir Edward CHAN Sai-cheong

Ex-officio Member Council Member (Division)

#### Ir Ken NG Kin-shing

Ex-officio Member (Discipline Representative) Buildings Department

Ir Alvin LAI Ho-cheong Co-opted Member

Buildings Department

#### Ir Alexis LEE Chi-chuen

*Co-opted Member* Arup

#### Ir LAU Chi-kin

Professional Assessment Committee Representative Sun Hung Kai Properties Ltd

#### Ir Prof CHAN Siu-Lai

Observer Department of Civil & Environmental Engineering, The Hong Kong Polytechnic University

#### Ir ALbert LEUNG

Wing-keung Observer Atkins China Limited

#### Ir TSE Kam-leung

Observer (Training Committee Representative) Architectural Services Department

#### Ir Jacky WONG Woon-ki Observer AECOM

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## **Chairman's Report** Session 2020/2021





It is indeed my greatest honour to be the 42<sup>nd</sup> Chairman of the HKIE Structural Division for the Session 2020/21. Since becoming the Chairman, I have been most excited with the work of the Structural Division. 2020/21 is still a difficult year as the COVID-19 has been kept affecting our daily life, posing significant challenges to the people of Hong Kong, amongst others in the world. To conform to the Government's directives and relevant rules, we have inevitably made difficult decisions to cancel some of our major events, such as Annual Dinner, overseas Technical Visit, Structural Engineering Competition for Youth and Annual Visit, etc. However, we had explored and grasped every opportunity to find some alternatives for hosting our activities in other feasible ways, like the hybrid modes for the Annual Seminar, online

technical webinars, virtual recording for the local technical visit, which are all our all first-time attempt ever since the set-up of the Structural Division.

Thanks to the collective efforts of all Committee Members, the Division still has managed to achieve another fruitful year during the pandemic. I would like to briefly report as follows-

#### Membership

As of end April 2021, the Structural Division has a membership of 6,053 of which 305 are Fellow Members and 4,533 are Corporate Members.

#### **Committee Major Activities**

With the concerted effort of Committee Members, the Structural Division has organized approximately 8 activities in this session including:

- Technical Webinars covering a wide range of topics
- Technical Visit
- Annual Seminar
- Structural Excellence Award

#### **Major Events**

**Assessment of the Structural Excellence Award 2021** was conducted in March 2021. Entries are categorised under Project Award and Research & Development Award. This year we were pleased to have 18 project submissions and 5 research paper submissions selected for the assessment. The Judging Panel, chaired by the Chairman of the HKIE Structural Division, is composed of the President of the HKIE, directorate representatives from Architectural Services Department, Buildings Department, Housing Department and Highways Department of the HKSAR Government. This year we have also invited 3 renowned professors as our reviewers. The award winners will be announced at the Division Annual General Meeting on 14 May 2021.

## **Chairman's Report** Session 2020/2021

Annual Seminar 2021, which was conducted in hybrid modes, i.e. both physical and online arrangement, was held on 3 May 2021 with the theme "Modernization and Modularization in Structural Engineering and Construction". We were most delighted to have Ir Albert CHENG, Executive Director of Construction Industry Council as our Guest of Honour, who had delivered a keynote speech at this major annual event. In the Annual Seminar, distinguished overseas and local speakers from academia to prominent practicing professionals shared their insights, experience and innovative ideas from recent researches in structural engineering and applications in construction projects. The Annual Seminar promoted innovation and new technologies to drive forward productivity, efficiency and enhanced project delivery outcomes in the construction industry. We have all together over 300 participants joining the Annual Seminar, during which, we have also presented the Structural Excellence Awards 2020 to the winners.

**Technical Visit** to the Kai Tak Sport Park development jointly organised by the HKIE Civil Division, Building Services Division and the Structural Division was conducted on 30 January 2021. Due to the gathering restrictions under COVID 19, real-time virtual recording technique was employed, which was found successful and well acknowledged by the participants.

Again, due to the COVID 19 and the respective pandemic restrictions, inevitably, we had made our difficult decision to cancel the **Annual Dinner 2020**, the **Best Student Awards 2020** and the **Best Reporter Awards 2020**. However, if the situation permits, we will seriously consider resuming both the events in the coming session.

#### **Continuous Professional Development**

The Division has played an important role in the development of the codes of practice for structural design in Hong Kong, and has published explanatory handbooks for the benefit of the structural engineering profession. We had issued a handbook for the Code of Practice for Structural Use of Steel to enhance the understanding on the design approach and application in second order analysis. We had also issued a Handbook on the Code of Practice for Structural Use of Glass to facilitate understanding and application of the structural use of glass in the industry. These handbooks had all been uploaded to the Website of the HKIE Structural Division for easy reference and use of members. In the meanwhile, we are also updating the Handbook for the Code of Practice for Structural Use of Concrete, and considering preparation of a Handbook for the revised Code of Practice on the Wind Effects. We do hope that our members will find these handbooks helpful for their daily work and professional development.

Instead of the traditional way in hosting technical meetings and seminars, during the pandemic, we have switched the arrangement and organized various seminars in the form of webinars with a view to providing support to members in the continuous professional development and experience sharing. In addition to those organized by our own, we have been ready at all times to collaborate with external institutions and bodies in conducting seminars, workshops and conferences for professional development whenever opportunities arise. Through these activities we continue to build strong links with external parties in promoting our profession in structural engineering.

## **Chairman's Report** Session 2020/2021

#### Serving the Community

We have been actively participating in serving the community throughout the year. Members were nominated to various Government committees, task forces and panels to render our professional advice to the Government in different aspects and at various stages of policy formulation, including the APSEC Discussion Forum of the Buildings Department, various standing technical committees on the drafting / review of local codes of practice of the Buildings Department, etc. Moreover, Committee Members play an important role as experts in the accreditation of university programmes, training schemes, and the assessment of application for registration as Registered Professional Engineer under the Engineers Registration Board.

The written examination of the HKIE Structural Examination was held on 30 November 2020 with 455 candidates. To help candidates prepare the examination, a seminar was held on 24 October 2020. The interview part will take place in June and July 2021. Candidates passing the HKIE Structural Examination and professional assessment, and meeting the experience requirements will be eligible to become Corporate Member of the HKIE in the Structural Discipline.

The Structural Division will continue to put in place various activities and events for all parties ranging from practicing engineers, graduated engineers, university students to secondary school students with a view to enriching the expectation and experience of our members while facilitating more understanding of the youngsters about the work life of structural engineers so as to arouse their interest in becoming structural engineers.

#### Appreciation

The success of the Division in the past years is attributed to the collective efforts from our past Chairpersons and Committee Members and, of course, to all members' participation and support. I would like to take this opportunity to thank all Committee Members of this session for their unceasing support and dedication to the Division in making 2020-21 another fruitful and successful year.

The Structural Division will continue to promote advancement of the structural engineering and to facilitate exchange of professional knowledge and experience amongst members. We look forward to receiving your active participation and continuous support to the Division.

Ir LAM King-kong Chairman of the HKIE Structural Division Session 2020/2021



### **The HKIE Structural Examination**

The HKIE Structural Examination consists of TWO parts: (a) written examination and (b) professional interview. Applicants passing both parts and meeting the experience requirements under the relevant routes to membership will be eligible to become Corporate Member of the HKIE in the Structural Discipline (subject to meeting other requirements in the HKIE Constitution). Passing the written examination is not a pre-requisite for taking the interview or vice versa.

The written examination of the HKIE Structural Examination 2020 was held on 30 November 2020 at the Kowloon bay International Trade & Exhibition Centre (KITEC). It consisted of two sections in the form of multiple-choice questions (one hour) and design questions (six hours). 455 candidates attended the written examination. Examination results will be announced in May 2021 and the professional interview will be held in June/July 2021.

#### **Chairman of Examination Board**

• Ir WONG Chi Ming

#### **Chief Examiners of Design Questions**

- Ir Prof CHAN Siu Lai
- Ir LEE Chi Chuen Alexis
- Ir LUK Win Kit Charles
- Ir NG Tim Yeung
- Ir TAM A Ray Albert
- Ir TANG Kevin

#### **Chief Examiners of M.C. Questions**

- Ir LAM King Kong
- Ir LAU Chi Kin
- Ir OH Yuk Choi
- Ir Dr SU Kai Leung
- Ir TSE Kam Leung
- Ir TSE Wai Keung

Lastly, I would like to express my heartfelt thanks to the examination Board Chairman, Chief Examiners, Examination Markers and Interviewers and, in particular, the SD Committee, for the dedicated efforts throughout.

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#### Ir Ken NG Kin-shing

Chairman of the HKIE Structural Discipline 30 April 2020

## Discipline Matters

### List of Marking Examiners

Ir Timothy John ALDEBURGH Ir Anthony AYIOMAMITIS Ir CHAN Chi Kong Ir CHAN Chi Ming Maverick Ir Prof CHAN Chu Fai Edmond Ir CHAN Chuna Mina Ir CHAN Ho Wai Winifred Ir CHAN Kar Lock Eric Ir CHAN Ngai Tung Ir CHAN Sai Cheong Edward Ir CHAN Siu Fai Ir CHAN Wah Chi Eddie Ir CHAN Wai Ching Ir CHAN Wai Tong Tong Ir Dr CHENG Hon Tuna Ir CHENG Kim Chung Ir CHENG Koon Yuk Ir CHEUNG Yiu Sun Wilson Ir CHIANG Yu Ho Alex Ir CHIK Wai Keung Ir CHIONG Kam Yueng Jacky Ir CHIU Chung Lai Ir CHIU Tze Mina Ir CHIU Yan Mong Anthony Ir CHOY Chun Chuen Ir Prof CHOY Siu Chung Adam Ir Dr CHU Chi Keung Paul Ir CHU Wui Cheuna Ir CHUNG Kam Yin Robinson Ir CHUNG Lung To Ir FAN Siu Kay Ir FUNG Ho Wing Ir FUNG Hoi Fai Ir FUNG Kim Ming Ir Nicholas James William HENRY Ir HO Chi Shun Ir HO Chung Leung Joseph Ir HO Ka Kit Kenith Ir HO Koon Ho Ir HO Tak Hong Stephen Ir HO Wai Kuen Adrian Ir Dr HO Wai Ming Goman Ir HOU Ting Fun Stephen Ir Dr HUI Ming Fong Lilian Ir David HUNG Ir IP Kwong Fat Nandi Ir IP Wai Leung Ir KONG Ming Paul Ir KONG Shui Sun Ir Dr KOON Chi Mina Ir KU Kwai Yau Ir KU Wai Ming Ir KUO Tung Ming Ir KWAN Kai Sing Ir KWAN Kin Kei Ir KWAN Po Jen Helen Ir KWOK Chi Tak Philip Ir KWOK Pang Hung Ir KWONG Po Lam Ir KWONG Shiu Kee Raumond Ir KWONG Wai Pang Ir LAI Ho Cheong

Ir LAI Hou Shun Otto Ir LAI Wai Wah Ir Dr LAI Yuk Fai Willu Ir LAM Chun Yin Kevin Ir LAM Ming Fai Ir LAM Nga Yan Ir LAM Pak Hung Jeremy Ir LAM Ping Chuen Lysander Ir LAM Tsz Fung Ir Dr LAU Chi Keuna Ir LAU Chi Ming Albert Ir Dr LAU Chi Wang James Ir I AU Chi Yau William Ir LAU Man Ching Matthew Ir Dr LAU Wing Hung Otto Ir LAU Wing Yin Ir Prof LAW Kwok Sang Ir LAW Yu Cheona Ir LEE Chi Chuen Alexis Ir Prof LEE Kai Kwong Peter Ir LEE Kwok Keung Lucas Ir LEE Mei Wai Teresa Ir LEE Ping Kuen Ir LEE Shih Mina Ir LEE Shiu Mina Ir LEE Sik Kwan Lawrence Ir LEE Siu Tona Ir I FF Wan Cheung Ir LEE Wing Hong Ir Dr LEE Yuk Nin Andy Ir LEE Yung Ling Christopher Ir LEI Veng Kei Ir LEUNG Chi Huna Ben Ir LEUNG Chi Suen Francis Ir LEUNG Chi Wina Ir LEUNG Huna Kwona Derrick Ir LEUNG Kin Fung Stephen Ir LEUNG Kin Kwong Ir LEUNG Pak Wai Ir LEUNG Wai Bun Ir LEUNG Wan Cheong Ir LEUNG Wina Lok Ir LEUNG Yu Wah Ir LING Wai Kit Ir Dr LIU Chi Hong Ir LIU Chi Kwun Albert Ir LIU Sik Wina Ir LIU Tai Chuen Ir Dr LIU Yuk Shing Ir LO Gon Fai Stephen Ir LO Man Chiu Raymond Ir LO Tak Fai Ir LOKE Hing Wa Ir LOONG Chun Wah Bernard Ir LUK Man Kit Ir MAK Kwok Shing Ir MAK Ming Fai Ir MAK Tsz Yee Ir Prof Neil Colin MICKLEBOROUGH Ir MOK Chi Wah Martin Ir MOK Hing Wah James

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Ir MOK Kin Yau Daniel Ir NG Chun Chung James Ir NG Pak Cheong Ir NGAI Wai Bun Ir NIP Ho Yin Frankie Ir PANG Pina Yiu Ir PUN Chupman Ir SETO Cheuk Ming Ir SO Kai Wing Claudius Ir SO Kit Keuna Ir SO Wah Wai Ir SO Yan Wing Ir SONG Ngan Ir SZE Wang Cho Ir TAI Chi Ho Ir TAM Hon Wing Ir TAM Yun Lam Benson Ir TANG Chi Ho Calvin Ir TANG Chung Ming William Ir TANG Lap Wing Ir TANG Wai Ming Raymond Ir Peter TO Ir TO Yui Kay Ir TSANG Ping Fai Kelvin Ir TSANG Sau Chung Paul Ir TSE Chun Kei Godvin Ir TSE Wing Chung Ir WAI Sai Chong Ir WAN Koon Piu Ir WAN Yiu Lun Ir WONG Allan Wai Hoong Ir WONG Bun Ir WONG Che Ming Patrick Ir WONG Chin To Louis Ir WONG Him Sun Ir WONG Hon Wah Ir WONG Kai Fat Ir WONG Kong Loi Ir WONG Kwok Chuen Richard Ir WONG Lai Kit Ir WONG Wai Hing Ir WONG Wai Ki Ir WONG Wing Keung Ir WONG Woon Ki Ir WONG Yat Cheong Ir WONG Yau Keung Ir WONG Yiu Wang Andes Ir WU Funa Sina Ir WU Kwok Wai Ir WU Po Tak Alex Ir YAP Kin Yung Ir YAU Hoi Ngan Alan Ir YAU Yiu Fong Ir YEUNG Chi Man Ir YEUNG Fei Jennu Ir YEUNG Yiu Wing Ir YIP Sik Kwona Ir YU Shek Man Ringo Ir YUE Chi Wai Sammy Ir YUEN Chi Hung Maurice Ir Dr YUEN Mui Rose

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## Event Highlights

## HKIE, Structural Division Technical Meetings & Visits 2020 – 2021

Date	Details	Speaker	
23 September 2020	Technical Webinar – The common failures of becoming a qualified structural engineer	Ir Dr Wing Huen FOK	
19 November 2020	Technical Webinar on "The Behaviour of Non-seimsically Designed RC Beam- Column Joints"	Ir Dr Wong Ho Fai, Simon	<page-header><section-header>          Construction         Construction         Construction         Construction           Construction        </section-header></page-header>
3 February 2021	Technical Webinar on "BIM-based smart design and construction technologies"	Dr Jung In Kim	
26 February 2021	Technical Webinar on "Resilience and Risk-Informed Coastal Infrastructure Design and Management considering Climate Change Effects"	Dr You Dong	TRUCKER BAREAN TRUCKER BAREAN
25 March 2021	Technical Webinar on "Simulating Urban Building Energy Dynamic with Inter-Building Effects (IBEs) Linked Building Networks"	Dr Chen Jiayu	
30 January 2021	Virtual Technical Visit to "Kai Tak Sports Park"	Mr Jason CHEUNG, Ms MM TONG, Mr Abe CHEUNG and Mr Jacky YU (Hip Hing Construction Company Limited), Mr John CHEUNG (Majestic Engineering Limited and Young's Engineering Limited)	

The Annual Seminar 2021 was successfully held on 3 May 2021 at 4/F, Conference Hall, Hong Kong Productivity Council Building. To cope with the unpredictable situation of Covid-19, this year our annual seminar was hosted in Hybrid format (Live and Virtual). The Seminar with the theme "Modernization and Modularization in Structural Engineering and Construction", was overwhelmingly received with over 300 participants in total.

Ir LAM King-kong, Chairman of the HKIE Structural Division (2020/2021), started the Annual Seminar with the Welcoming Speech. Keynote Speech was delivered by Guest of Honor Ir Albert CHENG, Executive Director of Construction Industry Council. Prominent local and overseas speakers shared their experiences, insights and ideas of innovation in recent researches in structural engineering and applications in construction projects.

Distinguished speakers included (in order of presentation): Dr Calvin KAM FAIA, PhD, PE, LEED AP, Ir LEUNG Wai Man, Prof LI Guo-Qiang, Ir Humphrey HO Hon Kit, Er CHEW Keat Chuan, Ir Richard SM LEE, Ir Daniel HW LEUNG, Ir Thomas TONG Yiu Nam.

Q&A sessions open to the floor were hosted by Ir Prof SL CHAN, Ir Dr Paul LAM, and Ir Prof CM CHAN. The event was successfully concluded following the closing remarks by Ir Ben TSE Wai-keung, Chairman of the Organizing Committee of the Annual Seminar 2021.

### **Organizing Committee of Annual Seminar 2021**

#### Chairman

Ir Ben TSE Wai-keung

#### Members

Ir Prof CHAN Siu-lai Ir Prof CHAN Chun-man Ir Albert A Ray TAM Ir Alvin LAI Ho-cheong Ir Kevin TANG Ir LAU Chi-kin Ir Dr Paul LAM Heung-fai



The Structural Excellence Award comes to over 10 years since 2006. It aims to promote excellence in structural engineering demonstrated through the design and construction of buildings and structures completed in the last two years.

There are two categories of entries, namely Projects and Research & Development (R&D). To follow the Government guidance of keeping social distance, Organizing Commitee has special arrangement this year. Jurors have given marks based on the submissions with no presentation required. On 20 March 2021, an assessment meeting has arranged for Jurors to have discussion and made final decision. Project Awards were decided with emphasis on Engineering Approach, Integration, Innovation / Creativity and Unusual Features, Buildability / Constructability / Safety, Energy Efficiency / Sustainbility / Seviceability / Economy and Aesthetics. R&D Awards were selected to the importance to Engineering Application, Theoretical background, Innovation / Originality and Future Impact.

### **Grand Award**

#### **Hong Kong Projects**

- LP6 (Catergory: Residential)
- Citygate Outlets' New Extension and The Silveri Hong Kong Mgallery (Catergory: Non-Residential)
- Heung Yuen Wai Control Point Buildings and Associated Facilities (Catergory: Non-Residential)
- Central Market Revitalization Project (Catergory: Heritage)
- The Hong Kong Polytechnic University Footbridge Linking Phase 8 and Main Campus (Catergory: Infrastructures & Footbridges)

#### **Mainland / Overseas Project**

- Shimao Qianhai Center (Catergory: Mainland / Oversea Project)

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#### **R&D** Award

- MDOF Extension of the Modified Bridge System method for the vehicle-bridge interaction problem

#### Members of the Judging Panel

#### **Organizing Committee**

Chairman Ir LAM King-kong

#### Members

Ir Prof P L YUEN Ir TSE Kam-leung, JP Ir Ken NG Kin-shing Ir Philip SHAM Sai-wah Ir CHAN Pai Ming

#### Reviewer

Ir Prof T K AU Prof Brian UY Prof HAN Lin-Hai Chairman Ir Ben TSE Wai-keung

#### Members

Ir Albert A Ray TAM Ir Kevin TANG Ir LAU Chi-kin Ir CHIN Sai-ping Ir Prof CHAN Chun-man Ir Alexis LEE Chi-chuen Ir Prof CHAN Siu-Lai Ir Dr Simon WONG Ho-fai

## **GRAND AWARD**

### LP6

Winner: C M Wong & Associates Ltd Category: Residential (Hong Kong)



Client: Structural Engineer: MTR Corporation Ltd / Nan Fung Group / Sino-Ocean Group C M Wong & Associates Ltd

Architect: DLN Architects (HK) Ltd Main Contractor: Hip Hing Construction CO Ltd

#### **Project Description**

LP6 is Phase 6 of the LOHAS development comprising 4 residential towers of 61-63 storeys and a 2 levels basement carpark. The buildings are structurally linked on plan in "obtuse elbow shape" to enhance stiffness to resist high wind loads from the adjacent sea front.

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- Semi-top down construction to achieve speed in construction and convenience in exporting soil through higher headroom;
- Steel collars cast in bored piles (columns) to facilitate precise floor structure connections;
- Crack inducers to alleviate concrete shrinkage effects installed in the structurally connected towers having length greater than 170m.

## **GRAND AWARD**

### Citygate Outlets New Extension and The Silveri Hong Kong – MGallery

Winner: AECOM Category: Non-Residential (Hong Kong)





Client:	Newfoundworld Project Management Limited (A consortium of Hang Lung Group Limited, Henderson Land Development Company Limited,		
Structural Engineer:	AECOM		
Design Architect:	Arquitectonica		
Main Contractor:	Hip Hing Construction Company Limited		

#### **Project Description**

With a gross floor area of approximately 50,000m<sup>2</sup>, the Citygate extension comprises a 2-storey basement and the Public Transport Terminus, a 7-storey retail space and a 9-storey hotel. The new complex serves as a main transportation hub connecting traffic infrastructure with a top-class shopping, dining, and leisure experience.

- Top-Down construction for early re-provision of the Public Transport Terminus
- Ground strengthening work to minimize settlement during excavation
- Hotel unit on precast slab with bearing pad to isolate from main structure
- Precast and pre-fabrication construction adopted for fast-track programme
- Forming opening on existing diaphragm wall for the connection to Citygate Outlets

## **GRAND AWARD**

### Heung Yuen Wai Boundary Control Point Buildings and Associated Facilities

(also known as Liantang Boundary Control Point)

Winner: Arup Category: Non-Residential (Hong Kong) © Ronald Lu & Partners





© Ronald Lu & Partners

Project Manager:	Architectural Services Department, HKSAR Government
Structural Engineer:	Arup

Architect:Ronald Lu & Partners (Hong Kong) LtdMain Contractor:Leighton Contractors (Asia) Ltd

#### **Project Description**

Heung Yuen Wai Control Point is in northern district of Hong Kong and working with Liantang Control Point in Shenzhen as the 7th land-based boundary crossing facilities. Hong Kong project site is a compact 18-hectare area accommodating 187,700sqm GFA for design daily vehicular and passenger capacity of 17,850 and 30,000 respectively. The development comprises of Passenger Terminal Building (PTB) and other 40+ ancillary buildings and facilities.

#### **Project Features**

PTB is a 120,000sqm GFA mixed-use transport complex, reinforced concrete construction for 280m x 220m footprint without expansion joint. Layout of at-grade public transport interchange and mezzanine carpark are designed to cope with various vehicles. Essential structural transfer is provided to support passenger halls with regular grids above. The South Entrance Roof Canopy attached to passenger hall is the project feature. The project was implemented as originally intended - buildable and functional with economy.

## **GRAND AWARD**

### **Central Market Revitalization Project**

Winner: Arup Category: Heritage (Hong Kong)





Client:	Urban Renewal Authority
Structural Engineer:	Arup

Architect: AGC Design Limited Main Contractor: Shui On Construction Co., Ltd.

#### **Project Description**

The Ex-Central Market Building was built in 1939. It is one of two pre-war market buildings remaining in Hong Kong.

The revitalization of the Ex-Central market Building has turned it into a landmark in Central, with the Building's character and architectural style, as well as its historical significance, retained.

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#### **Project Features**

Comprehensive inspections and assessments were employed to understand the loading capacities and condition of the pre-war building. In addition to the necessary upgrade to modern building regulations, new technologies such as Fibre-Reinforced-Polymer were implemented to restore structural capacity of deteriorated concrete members with minimum disruption and alteration to aesthetic appearance.

## **GRAND AWARD**

### The Hong Kong Polytechnic University – Footbridge Linking Phase 8 and Main Campus

#### Winner: Arup

Category: Infrastructures & Footbridges (Hong Kong)



Client: Structural Engineer: The Hong Kong Polytechnic University Arup

Architect:Andrew Lee King Fun & Associate Architects LimitedMain Contractor:Build King Construction Limited

#### **Project Description**

The footbridge is located across one of the heaviest traffic roads at Chatham Road South, linking the detached Block Z to the Main Campus of the Hong Kong Polytechnics University. Growing from the traditional campus built in the 70s, the project demonstrates the university's embracement of innovative and ingenious designs.

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#### **Project Features**

A bow-string arch form is intentionally chosen to respond visually to the new dynamics formed by the Innovation Tower and the new Block X as a unified composition. The design seeks the identity of a new 'Arch Way' to unite the main campus with the expansions as a single entity.

## **GRAND AWARD**

### Shimao Qianhai Center

Winner: Arup

Category: Mainland Projects (Including Macau & Taiwan) or Overseas Projects



© Zhangchao



© Zhangchao

Client: Shimao Group Structural Engineer: Arup

Architect:GenslerMain Contractor:China Construction Third Engineering Bureau Co., Ltd

#### **Project Description**

The Shimao Qianhai Center, developed by the Shimao Group, is located at the Shenzhen-Hong Kong Modern Service Industry Cooperation Zone. It has a height of 299.8m with 65 floors above ground, together with a 4-storey podium for retail. The GFA is 150,000m<sup>2</sup> which is mainly used for office space.

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#### **Project Features**

Inspired by the idea of close cooperation and development between Hong Kong and Shenzhen, the building has a distinctive spiral shape. An innovative twisted frame-core wall structure system was developed to adapt with the building's unique form. Numerous studies and optimisation work were completed for the project's safety and economic performance.

## **GRAND AWARD**

# MDOF Extension of the Modified Bridge System method for the vehicle-bridge interaction problem



#### Author(s):

#### Charikleia D. STOURA Elias G. DIMITRAKOPOULOS

Publication Date of Paper:19 December 2020Published Journal(s):Nonlinear Dynamics

#### Aims of the research / Paper Abstract:

This paper proposes a decoupling methodology, the Extended Modified Bridge System method, to effectively estimate the response of any bridge type independently of the traversing train. This method accounts for the effect of train on the supporting bridge via an additional damping, an additional stiffness, and an additional loading term.

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#### **Brief on unusual features**

The Extended Modified Bridge System method can be particularly useful in bridge design practice, as it does not necessitate the modelling of the complete train-bridge system. Crucially, it consistently accounts for the train-bridge interaction effect on the sustaining bridge, outperforming existing decoupling methodologies adopted for the design of railway bridges.

## **COMMENDATION MERIT**

### Design and Construction of Temporary Quarantine Facilities at Penny's Bay (Phase IIIB), Lantau Island, N. T.

Winner: China State Construction Engineering (Hong Kong) Ltd & Meinhardt C&S Ltd. Category: Non-Residential (Hong Kong)



Client: Structural Engineer: Department of Health Meinhardt C&S Ltd.

Architect:Wong & Ouyang (HK) LtdMain Contractor:China State Construction Engineering (Hong Kong) Ltd.

#### **Project Description**

Temporary Quarantine Facility at Penny's Bay (Phase IIIB) was set up in the Third Quarter of the year 2020 providing 850 units within 90 calendar days including site formation, underground services and roadworks. Design and construction together with the fabrication are undergoing the same pace to successfully complete the project.

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#### **Project Features**

The most Effective structural layout has been developed for MiC habitable unit. With benefit of the use of this simple rectangular structural layout and standardized the structural grid, construction process could be optimized. Simple rearrangement of partition walls and openings allowed high flexibility to suit future Transitional Housing Development.

## **COMMENDATION MERIT**

### **H ZENTRE**

Winner: Arup Category: Non-Residential (Hong Kong)





© Arup

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Client: Structural Engineer:	Henderson Land Development Company Limited Arup Stephen Cheng Consulting Engineers Limited (RSE)
Architect:	Wong & Ouyang (HK) Limited
Main Contractor:	Hong Kong Construction (General Builders) Limited

#### **Project Description**

H Zentre is a 20-storey commercial development including 3-storey basement. With a total GFA of 31,560m<sup>2</sup>, it is designed as a wellness and healthcare hub, complemented by dining, retail, wellness and car parking facilities. The superstructure is 85.8m above ground, with a 14.6m deep basement below ground.

- A true composite building utilizing composite slabs and beams, cellular beams for services integration, concrete-filled steel tube columns to increase floor efficiency
- Sustainable benefits with minimal formworks and falsework and reduced foundation loads to save time and cost
- Extra-high loading capacity structure for shielding compartment for medical equipment at basement

## **COMMENDATION MERIT**

### Temporary Quarantine Facilities at Penny's Bay (Phase II)

Winner: P&T Architects and Engineers Limited Category: Non-Residential (Hong Kong)





Client:Architectural Services DepartmentStructural Engineer:P&T Architects and Engineers Limited

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Architect:Ronald Lu & PartnersMain Contractor:Gammon Construction Limited

#### **Project Description**

Located at Penny's Bay, Lantau Island, the fast track project meets the urgent demand for quarantine facilities in Hong Kong. It consists of 44 blocks of quarantine buildings, medical and command posts, a satellite medical post, accommodation for operation staff and other facilities.

#### **Project Features**

All buildings of the project are designed for Modular Integrated Construction (MiC). 707 Steel MiC modules are used in for quarantine units and staff accommodation, and 30 Aluminium MiC modules are installed for 16 supporting facilities buildings. 2 storey staircase / corridor for quarantine buildings are designed for MiC/DfMA.

## **COMMENDATION MERIT**

### Shatin to Central Link SCL Contract 1121 - North South Line Cross Harbour Tunnels

Winner: Arcadis Design & Engineering Limited Category: Infrastructures & Footbridges (Hong Kong)





 Client:
 MTR Corporation Limited

 Structural Engineer:
 Arcadis Design & Engineering Limited

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 Architect:
 Aedas Limited

 Main Contractor:
 Penta Ocean-China State Joint Venture

#### **Project Description**

An innovative design and build contract of a 1.66km of Immersed Tube Tunnel (IMT) between Hung Hom and Causeway Bay, providing a vital link to the MTR network. The IMT prefabrication was done in one batch of 11 units in ex-Shek O Quarry and installed across the busy Victoria Harbour.

- The IMT was extended from the original design to replace more cut-and cover-tunnel portions at both ends of the Harbour
- Extensive geotechnical reviews to optimize the design for sustainability
- Repurpose and Recycle pre-existing concrete blocks in place of construction of massive in-situ dock gates

## **COMMENDATION MERIT**

### **Chapel of Sound**

Winner: Arup

Category: Mainland Projects (Including Macau & Taiwan) or Overseas Projects

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Client:Chengde Aranya Real Estate Development Co., Ltd.Structural Engineer:Arup

Architect:OPEN ArchitectureMain Contractor:Heilongjiang Sanjiang Construction Group Co., Ltd.

#### **Project Description**

Located in a rocky valley at the foot of the Jinshanling Great Wall, Chapel of Sound accommodates a semi-outdoor amphitheater, an outdoor performing stage and a rooftop viewing plateau. It is the pilot project in a scheme that aims to redevelop and vitalize this barren mountain area.

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#### **Project Features**

The concrete structure, which is almost the only material to achieve the architect's vision, is creatively engineered utilising advanced parametric and digital design technology to realise the unique undulating layered geometry and optimise the acoustic performance. The overall material consumption was minimised and the temporary construction materials were recycled locally.

## **COMMENDATION MERIT**

### **Nanjing IFC**

#### Winner: WSP (ASIA) LTD.

Category: Mainland Projects (Including Macau & Taiwan) or Overseas Projects





Client:	SUN HUNG KAI IFC (NANJING) CO.,LTD.
Structural Engineer:	WSP (ASIA) LTD.

Architect:KPF + P&T Architects and Engineers Ltd.Main Contractor:Shanghai Construction Group

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#### **Project Description**

Located at the heart of Hexi Central Business District and atop Yuantong Metro station, the 395,000m<sup>2</sup> mixed-use development is the latest landmark of Nanjing which integrates two Grade A office towers, a luxury hotel and a retail podium with three levels of basement for carpark and other retail facilities.

#### **Project Features**

With WSP's innovative, buildable, sustainable and economical engineering solutions, the team designed a distinctive steel crown feature, an 85m-long, 37m-wide 'Bridge Tower' and a 45m-long, 6-storey 'Glass Box' structure-free lobby, enabling the new development to become the leading one-stop retail, commercial and hospitality destination in the region.

## **COMMENDATION MERIT**

# Analytical solution to temperature-induced deformation of suspension bridges



Author(s):

Yi ZHOU Yong XIA Bo CHEN Yozo FUJINO

 Publication Date of Paper:
 20 May 2020

 Published Journal(s):
 Mechanical Systems and Signal Processing

#### Aims of the research / Paper Abstract:

This study investigated the mechanisms of temperature-induced displacement of suspension bridges, and derived general analytical formulas of the thermal response of different components of the suspension bridge. The formulas was verified using the field monitoring data of the 1377-m main span Tsing Ma Bridge at Hong Kong and 1991-m main span Akashi Kaikyo bridge in Japan.

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#### **Brief on unusual features**

This paper derives a simple and unified analytical solution in the form of a 1D equation, i.e.,  $\delta I = \alpha \cdot \delta T \cdot L_e$ , where  $L_e$  is the effective length of the component. A simplified version is illustrated in the following figure.

## **COMMENDATION MERIT**

### A review on Composite Actions of Plate-Reinforced Composite Coupling Beams



Author(s):

Ir Dr. SU Kai Leung, Ray Dr. SHAN Zhiwei

 Publication Date of Paper:
 June 2020

 Published Journal(s):
 Advanced Steel Construction

#### Aims of the research / Paper Abstract:

A review on composite actions of plate-reinforced composite (PRC) coupling beams which comprise a vertically embedded steel plate that is framed into the wall piers for anchorage and spans across the RC beam and provide a practical and effective alternative that resists extreme loads in building designs is conducted.

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#### **Brief on unusual features**

The composite actions between the RC components and the embeded steel plate are discussed. The factors that affect the shear strength and inelastic response of the PRC beams are elaborated. The findings can be used to enhance the understanding of practitioners on the load-transfer process and capability of PRC coupling beams.

## **COMMENDATION MERIT**

Bayesian operational modal analysis and assessment of a full-scale coupled structural system using the Bayes-Mode-ID



Author(s):

Lam Heung Fai Yang Jia Hua James L. Beck

 Publication Date of Paper:
 15 February 2019

 Published Journal(s):
 Engineering Structures

#### Aims of the research / Paper Abstract:

This paper presents a project about assessing structural performance and coupling vibrations of a training center in Hong Kong. Operational modal analysis is conducted using Bayes-Mode-ID, which is an efficient Bayesian modalcomponent-sampling system identification method for full-scale structures. The identified modal parameters reveal interesting dynamic behaviors of the coupled system.

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#### **Brief on unusual features**

The new Bayes-Mode-ID method is verified by a full-scale coupled-building. Implementation issues for Bayes-Mode-ID are discussed in detail. The modal parameters and their uncertainties are obtained by the Bayesian method. The modal parameters of the building are helpful for structural assessment.

## **COMMENDATION MERIT**

Experimental evidence on structural adequacy of high strength S690 steel welded joints with different heat input energy



Robotic Welding System Famue ARC Mate 100/C

#### Author(s):

Chung Kwok Fai Ho Ho Cheung Hu Yi Fei Kai Wang Xiao Liu Meng Xiao David A. Nethercot

 Publication Date of Paper:
 1 February 2020

 Published Journal(s):
 Engineering Structures

#### Aims of the research / Paper Abstract:

To demonstrate structural adequacy of high strength S690 welded joints in construction through experimental investigation.

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#### **Brief on unusual features**

It is demonstrated that by a proper control on the welding procedures and parameters during welding, it is possible to control or even eliminate any reduction in the mechanical properties of these S690 welded joints under either tension or compression.

## **FINALIST**

### Le Pont

Winner: C M Wong & Associates Ltd Category: Residential (Hong Kong)





Client:Alliance Grace LimitedStructural Engineer:C M Wong & Associates Ltd

Architect:Ronald Lu & Partners (Hong Kong) LtdMain Contractor:China Overseas Bldg. Construction Ltd

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#### **Project Description**

Le Pont at 99 So Kwun Wat Road is a residential development with an area of approximately 27000m<sup>2</sup> surrounded by 12 nos. of registered slope features. The development comprises 5 nos. of 17-storey towers and 30 nos. of 3-storey houses with two levels of basement carpark and one 2-storey kindergarten.

- Use of steel sky footbridge to connect 5 towers at roof level, including:
  - Approximately 20m triangular footbridge connecting Tower 2, 5 and 6
  - Approximately 10m linear footbridge connecting Tower 1 and 2
- Use of mixed foundation system consists of LDBP, socketed-h piles and raft footings

## **FINALIST**

### Public Housing Development at Tung Tau Estate Phase 8 (Wui Chi House, Tung Wui Estate)

Winner: Hong Kong Housing Authority – Structural Engineering Section 4 Category: Residential (Hong Kong)



Client:Hong Kong Housing AuthorityStructural Engineer:Hong Kong Housing Authority - Structural Engineering Section 4

 Architect:
 Hong Kong Housing Authority - Architectural Section 7

 Main Contractor:
 Sun Fook Kong Construction Limited

#### **Project Description**

Hong Kong Housing Authority's Public Housing Development at Tung Tau Estate Phase 8 comprises 1 domestic block (Wui Chi House), commercial, recreational and parking facilities. Site area is approximately 8400m<sup>2</sup>. Wui Chi House includes 2 towers of 29 storeys linked by 19 storeys on top of a 10m wide portal, providing 1033 flats.

#### **Project Features**

Construction of 10-storey high and 10m wide portal was critical for onward construction of typical floors above. To fit the overall programme, advance design and detail planning of the raised transfer plate, with adoption of Building Information Modelling (BIM), was implemented to control construction period. The portal was timely completed.

## **FINALIST**

### Black Point Power Station Additional Gas-Fired Generation Unit D1 Project

#### Winner: Arup Category: Non-Residential (Hong Kong)



Client: Structural Engineer: CLP Power Hong Kong Limited Arup

Architect: Arup Main Contractor: Leighton Contractors (Asia) Limited

#### **Project Description**

Located in the New Territories of Hong Kong, the Black Point Power Station is one of the world's largest gas-fired combined-cycle power stations. The new 562MW unit expands BPPS's overall generation capacity and features a state-of-theart configuration which provides an efficiency of around 60%.

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#### **Project Features**

The main civil works are the power island (PI) and cooling water (CW) system. The approx. 100m by 200m PI contains a turbine hall, heat recovery steam generator, stack and supporting systems. The architectural design was stepped volumes. The CW system is constructed of of 2.6m diameter pipes installed by pipe jacking.

© CLP

## FINALIST

### Data Centre Development at Kin Chuen Street, Kwai Chung

Winner: C M Wong & Associates Ltd Category: Non-Residential (Hong Kong)



Client: Structural Engineer: Gold Famous Development Limited C M Wong & Associates Ltd

Architect: Main Contractor: Andrew Lee King Fun & Associates & Architects Ltd. Chinney Construction Co. Ltd.

#### **Project Description**

The project at Kin Chuen Street is a state-ofart Data Centre development in Kwai Chung, specifically built for storage of digital equipment. The 14-storey building with two levels of basement carpark is sitting at the crossing of Kin Chuen Street and Castle Peak Road.

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- Combination of raft footings and LDBP foundation system in view of varying rockhead level and site constraints
- Bored piles in between existing MTR tunnels which pass through the site with pile caps bridging over to support superstructure above
- Raft footings set back from MTR structures to minimize disturbance on them

## **FINALIST**

### **Discovery Bay Marina Club Refurbishment Project**

#### Winner: Atkins China Limited Category: Non-Residential (Hong Kong)





Client: Hong Kong Resort Company Limited Structural Engineer: Atkins China Limited

Architect:Atkins China LimitedMain Contractor:Vicon Construction Company Limited

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#### **Project Description**

The redeveloped Discovery Bay Marina Club within the protected typhoon shelter composed of sloping seawall and breakwater, is built in compliance with the stringent set of building requirements approved by the Hong Kong Government and in accordance to the highest marina standards. Driven Steel Tubular Piles found in Marine Deposit was designed as foundation with floating reinforced concrete/ aluminium pontoons laterallu tied with foundation system, with stabilities and structural capacities.

- Driven Steel Tubular Piles found in Marine Deposit
- Floating pontoons laterally tie with driven piles
- Barrier-free access
- Aluminium Gangways
- Lateral Shear Pile Load Test
- Cathodic Protection
- Integrated E&M trench provides:
  - Supply power (max. 380V, 600A, 3-Phase)
  - water supply
  - Up to 5m-wide concrete floating pontoons
  - VHF channel allows instant communication between LYC office & yachts
  - Dockside emergency intercom
  - 24/7 mooring assistance, marina security & CCTV

## FINALIST

### **OUHK Jockey Club Institute of Healthcare (IOH)**

#### Winner: AECOM

Category: Non-Residential (Hong Kong)



Client: Structural Engineer: The Open University of Hong Kong AECOM

Architect: Main Contractor: Ronald Lu & Partners (Hong Kong) Ltd CR Construction Company Limited

#### **Project Description**

The new OUHK Jockey Club Institute of Healthcare (IOH), located at 1 Sheung Shing Street with a total gross floor area of 18,680 square meters, provides new teaching and learning facilities such as lecture theatres, nursing and healthcare laboratories, student activities rooms, learnings commons etc.

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- New Campus with Contemporary Design and Modern Facilities
- Modern Architecture with Iconic Green Features and Energy-Efficient Facade
- Creation of Sustainable and Environmentally Friendly Institute with Boundless Green Open Space
- Strong Integration between Innovation and Structural Design
- Practical Design with Constructability and Buildability

## List of Structural Division Chairmen

### Session Name of Chairman

<b>1</b> <sup>st</sup>	79/80	Ir TSUI Tack-kong	22 <sup>nd</sup>	00/01	Ir Prof Reuben CHU Pui-kwan
2 <sup>nd</sup>	80/81	Ir Prof Fred NG Sai-ho	23 <sup>rd</sup>	01/02	Ir Prof Paul PANG Tat-choi
3 <sup>rd</sup>	81/82	Ir Dr Raymond HO Chung-tai	24 <sup>th</sup>	02/03	Ir Johnny FAN Siu-kay
<b>4</b> <sup>th</sup>	82/83	Ir Andrew NGAI Bick-yau	25 <sup>th</sup>	03/04	Ir Helen KWAN Po-jen
5 <sup>th</sup>	83/84	Ir David George HOLMES	26 <sup>th</sup>	04/05	Ir Joseph MAK Yiu-wing
<b>6</b> <sup>th</sup>	84/85	Ir Brian POON Hon-yin	27 <sup>th</sup>	05/06	Ir Prof CHOY Kin-kuen
<b>7</b> <sup>th</sup>	85/86	Ir David CHAN Wing-keung	<b>28</b> <sup>th</sup>	06/07	Ir CHENG Yan-kee
<b>8</b> <sup>th</sup>	86/87	Ir Barry John STUBBINGS	<b>29</b> <sup>th</sup>	07/08	Ir KWAN Kin-kei
9 <sup>th</sup>	87/88	Ir Dr LAW Kwok-sang	30 <sup>th</sup>	08/09	Ir CHAN Siu-tack
10 <sup>th</sup>	88/89	Ir Patrick YIM Chun-nam	<b>31</b> st	09/10	Ir LAU Chi-kin
11 <sup>th</sup>	89/90	Ir Dr Joseph CHOW Ming-kuen	32 <sup>nd</sup>	10/11	Ir Dr KOON Chi-ming
12 <sup>th</sup>	90/91	Ir Bruce Malcolm FOX	33 <sup>rd</sup>	11/12	Ir Dr Eddie LAM Siu-shu
13 <sup>th</sup>	91/92	Ir TSE Pak-kin	34 <sup>th</sup>	12/13	Ir Gabriel YU Lin-keung
14 <sup>th</sup>	92/93	Ir Ricky SO Yau-chi	35 <sup>th</sup>	13/14	Ir Prof CHAN Siu-lai
15 <sup>th</sup>	93/94	Ir Hugh WU Sai-him	36 <sup>th</sup>	14/15	Ir Martin TSOI Wai-tong
16 <sup>th</sup>	94/95	Ir Ignatuis LAU Yik-sum	37 <sup>th</sup>	15/16	Ir Ken NG Kin-shing
17 <sup>th</sup>	95/96	Ir WONG Chi-ming	38 <sup>th</sup>	16/17	Ir LEUNG Kwok-tung
<b>18</b> <sup>th</sup>	96/97	Ir CHEUNG Kwok-ming	<b>39</b> <sup>th</sup>	17/18	Ir Edward CHAN Sai-cheong
19 <sup>th</sup>	97/98	Ir Prof KO Jan-ming	40 <sup>th</sup>	18/19	Ir TSE Kam-leung
20 <sup>th</sup>	98/99	Ir Prof James LAU Chi-wang	<b>41</b> st	19/20	Ir Prof Ben YOUNG
<b>21</b> <sup>st</sup>	99/00	Ir Kenneth Lau Kwong-hon	42 <sup>nd</sup>	20/21	Ir LAM King-kong

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