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HKIE x HKETO - Student Meeting at Imperial College
Engineering Career Prospects and Opportunities in Hong Kong
by President Ir Aaron BOK Kwok-ming
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Target Audience: Imperial College Students

Introduction

Gilford, distinguished guests, fellow teachers and students, ladies and gentlemen. Good evening.

I am happy to have a chance to meet with the talented engineer students here together with Gilford; and share with you as the President of the Hong Kong Institution of Engineers (HKIE) on the engineering career prospects and opportunities in Hong Kong.

I know youngsters nowadays talk about work-life balance. So I would like to start by sharing with you my second passion after engineering, which is mountain-biking, a hobby and sport that keep my work-life balanced. Actually, apart from biking in Hong Kong, I like traveling around the world by biking. In my view, that is the most wonderful and relaxing way in sightseeing the spectacular views of famous cities and the panoramic mountains and scenery. For instance, biking along the River Thames. If you think about it, engineering and mountain-biking have a lot in common. Like engineering, mountain-biking requires a precise mix of technology, precision and know-how. And like mountain biking, getting over difficult obstacles in our work depends on the willpower of engineers. That's why you may see in my upcoming speech, elements of mountain biking appear everywhere.

Opportunities in Hong Kong

Let me first share with you the opportunities in Hong Kong for engineers.

Like engineers in the UK contributing a lot to build the Great Britain, Hong Kong engineers contribute a lot to build Hong Kong as a liveable, competitive and sustainable "Asia's World City". Over the decades, Hong Kong engineers build many Engineering wonders, such as the Hong Kong International Airport, our Mass Transit Railway (MTR) system, as well as the cross-boundary "Hong Kong-Zhuhai-Macao Bridge" and the "Tsing Ma Bridge", etc, etc. But these projects are completed. Then, some people may ask "What's next? Are there any upcoming major development plan in Hong Kong?".

Hong Kong Roadmap Initiatives

I can firmly tell you all here, Hong Kong now stands in times where we are going to build a much smarter, greener and happier city. To meet both opportunities and challenges ahead, Hong Kong has a strategic development plan to implement a new roadmap. A lot of initiatives have been set out by the HKSAR Government. On engineering related sides, these initiatives span over land, housing, transportation and innovation and technology developments. Among various initiatives, our new leadership shows particular determination in accelerating the launch of mega-projects like the Northern metropolis, the Harbour metropolis and new housing and land developments, together with supporting infrastructures. Furthermore, re-industrialisation and innovation-driven manufacturing are seen as new drivers of growth as part of Hong Kong's new role as Technology & Innovations Hub. All these translate into a strong call from the community for a better and more timely delivery of professional services from the engineering profession.

Current Major Civil Works

To follow the Hong Kong development strategy, mega size infrastructure works are one of the first to commence forming the backbone of the regime. As shown in the map

here, there are at least 11 major civil works[1] actively in progress in Hong Kong currently; such as the Hung Shui Kiu / Ha Tsuen, Kwu Tung North and Fanling North New Development Areas (or in short NDAs); Lok Ma Chau Loop Development; Relocation of Shatin Sewage Treatment Plant into Cavern; Trunk Road T2; Cross Bay Link and Tseung Kwan O - Lam Tin Tunnel (which are going to be open in the coming Sunday); Central Kowloon Route; Tung Chung New Town Extension; and the 3rd Airport Runway project.

Land Development Projects

Hong Kong has a hilly terrain and has been famous on our land hungry problems for decades. Most of our flatter land are engineers-made via site formation or reclamation. In Hong Kong, the total land area is 1,117 km^2 (= 111,700 hectares), but only 25.4% is urban or build-up land[2].

A list of possible solution spaces has now been suggested to respond to the land shortfall in Hong Kong. These solution spaces include the Tseung Kwan O Area 137 development, Northern Metropolis and Kau Yi Chau Artificial Islands; which are expected to contribute towards our major land supply in the medium to long term for housing, commercial, industrial, hospital or all types of developments.

This slide shows the solution space of Kau Yi Chau Artificial Islands which is sometime called the “Harbour Metropolis”. For this reclamation development, the potential land supply is 1,000 hectares for up to 260,000 housing units. The plan is also to develop

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[1] 1) Hung Shui Kiu / Ha Tsuen Development; 2) Kwu Tung North and Fanling North Development; 3) Lok Ma Chau Loop Development; 4) Shek Wu Hui Effluent Polishing Plant; 5) Relocation of Shatin Sewage Treatment Plant; 6) Trunk Road T2 and Cha Kwo Ling Tunnel; 7) Tseung Kwan O - Lam Tin Tunnel; 8) Kai Tak Development; 9) Central Kowloon Route; 10) Tung Chung New Town Extension; 11) Airport Three Runway System

[2] https://www.pland.gov.hk/pland_en/info_serv/statistic/landu.html

this area as the 3rd Central Business District (CBD) with 4Mm^2 commercial GFA to enhance Hong Kong's competitiveness as a financial, commercial and trade centre.

The Northern Metropolis project is the development strategy which proposes to expand the Northern Economic Belt in Hong Kong. The spatial layout of the Northern Metropolis will cover two district administration areas, viz. the North District and the Yuen Long District, which straddle an area of about 30,000 hectares.

The Northern Metropolis will encompass 2 mature new towns and several NDAs within the region. The Northern Metropolis is the most vibrant area where urban development and major population growth of Hong Kong in the next 20 years will take place.

With these multi-pronged approaches, the supply of additional developable land in Hong Kong will reach 3,280 hectares in the future 10 years and show an upward trend. In 2022-23, the supply of land will be 110 hectares and increase to 480 hectares in 2032-33.

Housing Development

Solving the housing problem sits atop the agenda of the current-term Government. To deal with the problem of inadequate accommodation, Hong Kong targets to increase the total housing supply in 10 years' time to 430,000 units, including 301,000 public housing units and 129,000 private housing units.

Hong Kong will enhance quantity, speed, efficiency and quality in various aspects to vigorously compress the time required to build infrastructures, especially on land and housing supply. To demonstrate this commitment, our new Chief Executive proposed to build additional 30,000 units of new Light Public Housing (LPH), by mainly using Modular Integrated Construction (MiC) method, in the coming five years; thus boost the overall public housing production substantially by about 50% in the first five years period. On private housing side, we will provide no less than 72,000 residential units in the next five years.

Transportation Development

For transport infrastructures, it is recommended to take forward three major road projects, which are indicated by BLUE arrows, such as the Shatin Bypass and Northern Metropolis highway; and three railway projects, which are indicated by RED arrows, such as Central Rail Link and the HK-Shenzhen Western Rail Link, to meet the transport needs of the Northern Metropolis Development Strategy and other long-term developments in Hong Kong.

Apart from the above said 6 major projects, other railway and road network projects are also under development. These include the Route 11, Tuen Mun Western Bypass, Northern Rail Link and Railway serving the Kau Yi Chau island linking North West New Territories to Hong Kong Island.

All the above Hong Kong developments translates to this graph showing the mid-term to long-term construction expenditure forecast for public and private sectors. Coving all these initiatives, the annual construction expenditure is expected to increase from today's GBP 26 billion to more than GBP 36.5 billion in 10 years' time; which is almost a 40% increase.

Hong Kong Innovation and Technology Development Blueprint

To chart Hong Kong in moving full steam towards its vision of an international innovation and technology (I&T) centre, the Government is going to promulgate the Hong Kong I&T Development Blueprint within this year. The Government will set out major policies and develop relevant infrastructure to achieve 4 broad development directions, including:

1. Enhance the I&T ecosystem and achieve re-industrialisation in Hong Kong
2. Enlarge the I&T talent pool to create strong impetus for growth
3. Develop Hong Kong into a smart city to improve the quality of life of our people
4. Proactively integrate into the overall development of the country and consolidate Hong Kong's advantages as an international city.

To strengthen infrastructure and facilities to achieve the goal, the Government will move ahead with the construction of the Hong Kong-Shenzhen Innovation and Technology Park (HSITP) and expedite the development of San Tin Technopole in the Northern Metropolis. The expansion works of the Science Park and Cyberport will be completed in phases from 2025 onward, providing 100,000 square metres of additional floor area. The Government is also planning the Science Park/Pak Shek Kok Station of the East Rail Line for commissioning by 2033.

To enlarge the I&T talent pool to create strong impetus for growth, the Government is planning to adopt additional measures focusing on attracting I&T talents. To attract leading I&T talents around the globe, the Government will provide special facilitation measures to attract top-notch I&T talents to bring with them their business or R&D outcomes to Hong Kong. The Government will enhance existing technology talent schemes, including subsidy increment and provision of living allowance to research talents with doctoral degree. The Government will also build more accommodation facilities for I&T talents near to the Science Park and the HSITP. For the STEM Internship Scheme, this is the initiative offer to the university students studying STEM (Science, Technology, Engineering and Mathematics) programmes established by designated Hong Kong universities.

With Mega projects like Harbour Metropolis and the Northern Metropolis ready to go, as per our estimates, construction expenditures may increase by 40% from their regular levels for the next 20 years. Meanwhile, Hong Kong's integration with the Greater Bay Area and the I & T Hub policy will offer new opportunities across all engineering disciplines, from manufacturing and automotive to aviation and Artificial Intelligence. What could be better than this golden age for becoming an engineer? While we should remain humble, there is no reason for us not to be proud.

Get Ready to Meet the Opportunities and Challenges

BUT, are we ready to meet the opportunities and challenges ahead Hong Kong?

As I mentioned earlier, there are a lot of opportunities arising from the Hong Kong infrastructures & developments for our engineers.

To borrow our Chief Executive's slogan of "Enhance quantity, speed, efficiency and quality" in his policy address this year, I would suggest our engineers must be prepared to work smarter to achieve the aims of expediting development, improving efficiency, increasing quantity and raising quality in order to fulfil the missions vested upon us by the community.

To work smart, we should embrace innovation to enhance our capacities to meet the new challenges. One of the prevailing trends is adopting MiC for construction projects. In Hong Kong, we have more than 70 housing projects, including the Light Public Housing I have mentioned earlier, which are going to be built by MiC. By adopting MiC, we can save the construction time, increase productivity, reduce waste and enhance work safety.

Another smart solution is Building Information Modelling (BIM), which is an innovative approach to building design and construction. In Hong Kong, we adopt BIM for public works with the production cost over GBP 3.14 million. We have applied BIM in over 400 Hong Kong public projects for design visualisation, including the applications of 4D, 5D and 6D BIM.

To build a smart city, new innovations and technology are widely applied. Not only the solutions like MiC and BIM I have just mentioned, there are also new technologies adopted in different kind of construction projects such as cavern construction and super high strength steel, etc.

Human development sometime has come at the expense of the environment. Climate change is the defining challenge of our time, and it affects everyone of usTo adapt and combat climate change, each country around the world strive to take actions. In Hong Kong, we have the Hong Kong's Climate Action Plan 2050 which sets the vision of "Zero-carbon Emissions • Liveable City • Sustainable Development", which commits ourselves to a more aggressive medium-term target to reduce total carbon emissions of Hong Kong by half against the 2005 level before 2035. We have also river revitalization project. We also have desalination plant to treat and make usable the abundant seawater available. We are also planning to construct the first Eco-shoreline in Hong Kong to enhance biodiversity by mimicking the ecological habitat of natural inter-tidal zones.

We now stand in times with a lot of new challenges. We need to be smart to survive in the society. The industry looks for smarter solutions, and the entrepreneur also strives to build teams of highly skilled, intelligent, and smart people. So as engineering students, you should equip yourself as a smart person to tackle these future challenges.

Then how to equip yourself as our future smart engineer? In Hong Kong, the HKIE is the learned society to promote the professional standing, interests and technical standards of local engineers across a broad spectrum of engineering specialisations.

Unlike UK, the HKIE is a multi-disciplinary body responsible for qualifying engineers and setting standards for training and admission of engineers. Admission normally falls into one of the 21 Disciplines covering civil, geotechnical, mechanical, structural, building services, IT, etc.

In HKIE, Fellows and Members are professionally qualified engineers and recognised as Corporate Members in good standing and accepted by all major Clients, including the government, as employment qualification requirements. Some of our members can apply for cross discipline qualification as well.

For students studying programmes recognised under Washington Accord and Sydney Accord in the UK and Canada, you are already eligible to apply for the HKIE free membership scheme.

To provide graduate trainees with the opportunity to reinforce their theoretical knowledge through structured practical work thus enhancing their professional knowledge, HKIE provides them with the Scheme "A" Graduate Training Scheme. Training experiences should be gained through relevant work assigned on actual projects. The trainee will be able to learn and contribute to the company while undergoing the training activities.

To prepare yourself as the prospective engineer, there are several personal qualities that are required to be developed, including problem solving, creativity, critical thinking, teamwork, adaptation to changes, project management, written communication skills and presentation skills.

You should also demonstrate the qualities of professional acumen, responsibilities to society, integrity & ethics in order to meet the upcoming challenges.

Proud to be Engineer

Engineers need to be prepared to face future challenges; so does the HKIE. I am honour to be elected as the President at this right moment to lead the Institution to meet these amazing opportunities and demanding challenges ahead. I now tell you my plan. I always said "What engineers do are right at the heart of the City's advancement and human civilisation". Hence we must stop shying away from being proud of our profession. So in my President year, I advocate:

HKIE - Time to Change

Commitment to Change - Boosting Professionalism

香港工程師學會 - 專業維新

WE ARE PROUD TO BE ENGINEERS

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"Boosting Professionalism" is the theme and "Proud to be Engineers" is the slogan for me to lead my fellows in this Session. It reflects my conviction that we pride in our profession, and it is our responsibility to remind the public about the importance of engineering in our daily life.

Alongside the slogan, I advocate 3 mottos:

While we are Proud to be Engineers! We will:-

- Deliver our Services to the Community Professionally with Heart and Diligence;
- Tell Good Engineering Stories; and
- Nurture Talented Successors

It is thus the Institution's mission to give engineers the tools they need to grow as professionals and hence they can in return help our profession's growth and succession. I shared with various major Professional Engineering Institutions on Tuesday my year plan on achieving this. So I'm not going to repeat these today. If you wish to know them, you are always welcome to listen to my Presidential Address on 19 October or my speech on this Tuesday which we would post on our website and Facebook, etc.

Final Remarks

Before closing, I would like to share with you my last advice. There is no reason for you all in this room not to feel proud of being an engineering student. Since, you have chosen the most correct decision to have joined the career path for a most noble

profession, the mission of which is to direct the Great Power of Nature for the benefit of mankind, with a very promising future.

Let’s all be proud of Engineers. Thank you!

Ir Aaron BOK Kwok-ming
President
The HKIE