

The Future of The Geotechnical Industry in Hong Kong

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Chairman – Mark Wallace (Arup)



香港岩土及岩土環境工程專業協會
ASSOCIATION OF GEOTECHNICAL &
GEOENVIRONMENTAL SPECIALISTS (HONG KONG)

Speakers

- **John Massey – CEDD**

“ Hong Kong Geotechnical Work (Sustainability and Trends)”

- **Joseph Lo – MGS**

“Geotechnical Consultancy / Expertise (Is the Mainland the Future)”

- **Arthur So – China State Construction**

“Geotechnical Contracting (Current and Future)”

- **DISCUSSION AND DEBATE (ALL PRESENT)**

Part 1 – Hong Kong Geotechnical Work

(Sustainability and Trends)

by

John Massey



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Part 2 – Geotechnical Consultancy / Expertise

(Is the Mainland the Future ?)

by

Joseph Lo



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Future of the Geotechnical Industry in Hong Kong



Current Trend in China

1. Summary of highway tunnels

Year	Number of tunnels	Total length (km)
1950s	30	2.5
1979	374	52
1993	682	136
2000	1684	628
2002	1782	704

2. Railway tunnels

Number of tunnels = 5,300

Total length = 2,500km

National Planning

- National 5-year plan
 - 1) 1st Five-Year Plan period (1953 to 1957)
 - 2) 2nd Five-Year Plan period (1958 to 1962)
 - 3) 3rd Five-Year Plan period (1966 to 1970)
 - 4) 4th Five-Year Plan period (1971 to 1975)
 - 5) 5th & 6th Five-Year Plan period (1976 to 1985)
 - 6) 7th Five-Year Plan period (1986 to 1990)
 - 7) 8th Five-Year Plan period (1991 to 1995)
 - 8) 9th Five-Year Plan period (1996 to 2000)
 - 9) 10th Five-Year Plan period (2001 to 2005)
- Transport Development in 10th Five-Year Plan
 - 1) The total mileage of highway will be 1.6 million km with an increase of 200,000 km in five years
 - 2) The density of highway network will be 16.7 km/100 square kilometers

Trunk Road Planning

五纵七横

**five north-south and
seven east-west**

Five north-south :

- 黑龙江同江到三亚
- 北京到福州
- 北京到珠海
- 二连浩特到河口
- 重庆到湛江

Seven east-west :

- 绥芬河到满洲里
- 丹东到拉萨
- 青海到银川
- 连云港到霍尔果斯
- 上海到成都
- 上海到瑞丽
- 衡阳到昆明



Metro Planning

Metro tunnels under construction

1. Beijing metro line 5
2. Shanghai metro line 3
3. Guangzhou metro line 2
4. Shenzhen metro line 3
5. Nanjing metro
6. Tianjin metro

Metro tunnels under planning

1. Wuhan metro line 2
2. Chengdu metro line 3
3. Hanzhou metro

More Tunnels

1. Tunnels constructed (five nr.)

打浦路隧道；延安东路隧道北线和南线隧道；外环隧道；
大连路隧道；复兴东路隧道

2. Tunnels under construction (three nr.)

翔殷路隧道、上中路隧道、崇明越江通道南港隧道

3. Tunnels under planning (five nr.)

军工路隧道、长江西路隧道、新建路隧道、人民路隧道、
龙耀路隧道

4. Target: 99 traffic lanes by 2020

TBMs for Metro Construction

1. Seven $\phi 6.34\text{m}$ EPB machines for Shanghai metro line 1 (1991-1993). Tunneling rate 200-250m/month. Ground settlement 30mm
2. Ten EPB machines for Shanghai metro line 2 (total length 24km, 1995) and Pearl line phase II (2000)
3. Two $\phi 6.14\text{m}$ EPB machines for Guangzhou metro line 2 (total length 3.423km, including river crossing, ground: CDG, 2000)
4. One EPB machine for Beijing metro line 5 (2000)
5. Three EPB machines for Nanjing metro line 1
6. Twenty cities are planning to build metro lines within ten years (2000-2009). Total length might be up to 500km

Therefore, there is a great TBM market in China.

Prediction of TBM supply in 2000-2009

TBM	Dia (m)	Nr.	Unit price (USD)	Total (USD)	Remarks
EPB or slurry shield	6	70	5×10^6	350×10^6	500km metro
	3~5	100	$(2-4) \times 10^6$	300×10^6	600km municipal
Mix shield	6	15	6×10^6	90×10^6	120km metro
TBM	4~5	20	10×10^6	200×10^6	200km hydro
	8~9	6	30×10^6	180×10^6	60km rail
Total		181		1120×10^6	

Future Economic Growth

- Economy in China grows very fast
- Economic strength of China will take over Japan in 20 to 30 years
- Hong Kong is part of China
- Our future looks pretty good

Young Engineer Future

- From October 2005, young graduates in HK can work in China
- Young engineer should prepare to work anywhere in China
- Don't look at current market but focus on long term vision (e.g. the stock price of Shanghai Bank went up 650 times over the last 30 years period)

Our Skills

- Pursuit of Technical Excellence
- Be focus, and be No. 1 not No. 2 (e.g. slope safety system)
- Hong Kong has demonstrated our skill to the world (e.g. our slope, railway, tunnel engineers work all over the world)
- Knowledge is the most powerful tool
- Learn, learn, learn...

Conclusion – Do we see a Future?

- **Facts & Figures to illustrate our present and future**
- **1982 – 1985, graduates looked for work / training without salary. Civil Engineering graduates could hardly find a job**
- **2005, graduates can find a job but they complain that salary is too low and working hour is too long**
- **Salaries are still very high for engineers when compared with the rest of the world**

Thank You



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Part 3 - Geotechnical Contracting (Current and Future)

by

Arthur K O So

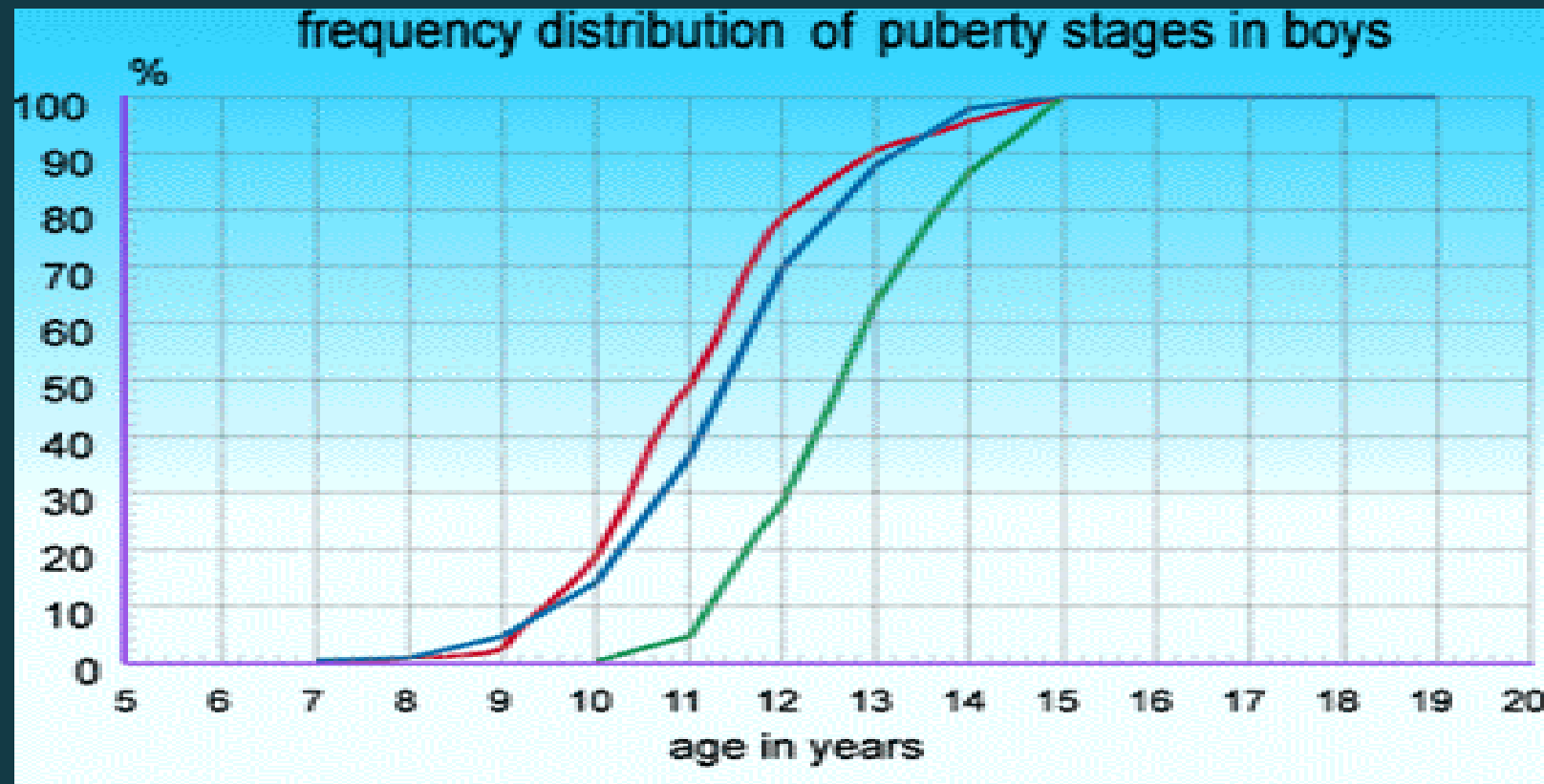


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A Sad Scene

- Most of the big civil works have completed.
- Hong Kong Housing Authority has ceased to build self-ownership flats.
- Construction work in the last few years is only 30% of that at the blooming time.
- Competition is high and everybody is loosing money.

A Sigmoid Growth Chart



SWOT Analysis



Strength

Specialist

- **microscopically**

- soil structures
- soil properties
- seepage
- etc

- **macroscopically**

- slopes
- retaining walls
- anchors
- foundations
- ground treatment
- etc

Weakness

- Narrow experience
- Know not much about economy

Opportunities

- **Hong Kong**
 - Mountainous
 - Densely Populated
 - Extensive Slope Works, Site Formation, Roads and Bridges, Tunnels, Difficult Foundation
- **China, Macau, South East Asia, and Middle East**
 - Large Market
 - Lots of Development
 - Inadequate Skill
 - Demand for Professional and Technology

Threats

- **Hong Kong**
 - Economical Recession
 - Shrinkage Market
 - Large Competition
 - Low Profit Margin
 - Fully Developed
 - No Future !!!
- **China, Macau, South East Asia, and Middle East**
 - Ignorant to Working Environment
 - Compete with International
 - Language Obstacles
 - Away from Sweat Home ???

Experience from Developed Countries gives us the answers

- **Plenty of expertise**
- **High technology**
- **Insufficient construction works at home**
- **Export knowledge, skill and technology**

What could we do ?

- **Expand our market – locally and overseas**
- **Let the specialist solve the specialist problems**
- **Sharpen our edge**
 - Further education
 - Research and development
 - Seminars and workshops
- **Attract Talent to the industry by rewarding them**
 - Social status
 - Better paid

Thank You



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Debate / Discussion Issues



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