

"**W**hat have you done for the HKIS and what will you do if you become a HKIS member?" One question coming out from last month's APC interview session.

A round of applause to the assessor who raised this question. I think questions like these should be made mandatory in APC and they should be the second most important questions after those on professional ethics.

We need to ingrain our new members a culture to contribute to and care about the well being of the profession.

The existing HKIS infrastructure has actually provided a wide array of opportunities for young members serving the Institute. Joining the Junior Organisation is one option, but few are willing to come forward. Problems at the junior level do not augur well for the future of the profession.

Change is needed at every level!

Right at the beginning of the year, the Editorial Board promised to continue the good efforts of the last Editorial Board in bringing changes to Surveyors Times. The new cover design, layout and even the publication name can be taken as an epitome of our new resolves. Some of these changes were seen radical to some of our members, as revealed in our recent Readership Survey.

But our reform drive goes beyond few cosmetic improvements. One noticeable change is the sheer commitment shown by our Editorial Board members. Conrad Tang, Danny Cheung, Cliff Tse, Stephen Chung and James Longbottom have been setting good examples by contributing articles.

Secondly, we have made some headway with an addition of a theme in each month's publication. For this month's "Land Surveyor's" theme, special thanks go to Dr Conrad Tang for his hard work in rallying support from LSD members.

Halfway through 2003, we have also made some good progress in drawing contributions from new members. We were particularly delighted at the fact that some of these new contributors were from young members.

As revealed in the our recent Readership Survey, we discovered that a number of members do not realize that every member can make a contribution to Surveyors Times and by doing so they can claim some CPD hours for their research efforts.

We thank many of you for responding to the Survey. You have given the Editorial Board many good ideas that will help us to intensify efforts in the improvement of the Surveyors Times.

But don't forget we count on you to send in articles.

Let us join hands in making Surveyors Times **H**umming, **K**nowledgeable, **I**nquisitive, and **S**erving!

**Jim Yip**, Hon Editor  
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# The 7th South East Asian Survey Congress 2003, Hong Kong

The 7th South East Asian Survey Congress (7th SEASC2003) will take place in Hong Kong from November 3-7, 2003.

This has been the premier fixture in the SE Asian Calendar of Surveying Conferences since 1979, when the first Congress was staged in Singapore. Since that initial event, Congresses have been held successively in Hong Kong in 1983, Bali in 1988, Kuala Lumpur in 1991, Singapore in 1995 and Fremantle in 1999. All have been a resounding success.

The Congress this year returns for a second time to Hong Kong, and will follow the usual well-proven format of informative sessions, featuring prominent guests from across the globe including local representatives, The Hon. Michael Suen Ming-yeung GBS, JP, Secretary for Housing, Planning and Lands, the Government of the Hong Kong SAR and Mr Shih Wing Ching, Chairman, Centaline Group. Also, prominent overseas speakers will include Prof. Dipl.-Ing. Dr.-Ing. Holger Magel, FIG President and Prof. Yang Kai, President of the Chinese Society of Geodesy, Photogrammetry and Cartography (CSGPC), Mr Earl Bruester McDonald James of Australia, Dr Bill Robertson, Chairman, Aspect North surveying and mapping group and Terralink International Limited (TIL) of New Zealand and the President of ASEAN FLAG to name just a few!

The technical sessions will have more than one hundred papers presented dealing with a wide range of topics including:

1. Cadastral Surveying
2. Geodetic Surveying
3. Engineering Surveying
4. Hydrographic Surveying
5. Photogrammetric Surveying and Remote Sensing
6. GIS and Spatial Information Management
7. Valuation and Land Management
8. Project, Cost and Contract Management
9. Survey Instruments
10. Professional Standards and Education, and
11. History of Surveying.

Experts and leading exponents in their various fields will address delegates, and provide an insight into the latest in research and development.

The technical exhibition will provide delegates with the opportunity to see at first hand the latest development in instrumentation in surveying technology, and to discuss their requirements, interests or problems with the manufacturers and suppliers of the most modern equipment available. The leading players such as Leica Geosystems Ltd., Autodesk Far East Ltd., Bentley Systems Ltd., PCCW Directories Ltd., Soka Precision Instruments Ltd. & Sokkia Singapore Pte Ltd., Topcon Optical (HK) Ltd. and many more have committed their valuable support by sponsoring the Congress and it looks to be an attractive showcase for all!

The exhibition will be open to the Trade Users from 3:30pm onwards on Wednesday, 5 November and Thursday, 6 November.

The technical tours will give delegates a perspective of the working environment of surveying in Hong Kong, while permitting them to view projects in the course of construction, and enabling them to discuss matters of common interest with local practitioners. Tours will include both indoor and outdoor site inspections, with visits scheduled to the Lands Department of The Government of the Hong Kong SAR; Consultant's Infrastructure Project (The Ma On Shan Rail Project), HK Planning & Infrastructure Exhibition Gallery and Cyberport.

A post-congress technical tour to nearby Shenzhen and Macau will be available as an optional extra, and will permit delegates to see, albeit very briefly, the One China - Three Systems concept, in operation. An official visit to the Cartography and Cadastra Bureau, The Government of the Macau SAR will be included in the tour.

The social programme should cater for all tastes, with a good mixture of events on the agenda. The Welcome Reception and the Official Congress Banquet will provide fun, food and fellowship, while an optional Melbourne Cup lunch at the Happy Valley racetrack will also be available. An

evening cruise through Hong Kong Harbour to a seafood dinner on nearby Lamma Island is another option available. This will give delegates an opportunity to unwind and relax on the final night of the congress.

The Congress promises to be a memorable event, and all are welcome to attend. We anticipate attendance of over four hundred to attend from across the globe. Your Hong Kong hosts - the Hong Kong Institute of Surveyors and the Hong Kong Government's Lands Department - will do their utmost to ensure that delegates enjoy their time in Hong Kong to the full. And rest assured the programme for accompanying persons will certainly cater for those whose interests may lie somewhere outside the professional and technical deliberations of the congress.

The theme is - 'From Compass and Pacing to Cyber Spacing - How does SE Asian Surveying Measure Up?' Plenty of scope within that theme to review developments in SE Asia over the past half century, to assess where the region, and the surveying world in general stands today, in the face of modern technology, and perhaps to predict where we are going.

So register now and enjoy the Early-Bird Registration rate before the deadline on 31 July 2003! For full details please visit [www.seasc2003hk.org](http://www.seasc2003hk.org).

And don't forget: **SEASC 2003** - the place to be! See you all there! ☺

# Flying on the Water

The HKIS dragon boat teams raced their best and enjoyed a beautiful day in Stanley



Reported by Vincent LIM



In the early morning of 4 June, the tranquil Stanley town was infected with a festive mood as hundreds of revelers, making up of about 200 dragon boat teams, descended onto the Stanley Main Beach and took part in the annual dragon boat race. Clad in beautiful team colors, they were chanting, cheering, and stretching.

Sponsored by the Junior Organisation, the HKIS sent two teams into the race. Crew members were made up of a total of 60 members, from all disciplines and the surveying streams from the three universities. Unlike our practice in previous years, this year we set up an "Elite Team" with members who had completed all the six pre-race training sessions. We were assigned with a mission to bring home a trophy.

We put up a courageous performance and in the first race we were neck and neck with the PCCW team, the most formidable team who went on to win the race, until the mid-way buoy where we started to lose ground.

Our second team, called the "Fun Boat", held off the challenge from the choppy waters and managed to return to shore safely.

The whole day event was not all about the boat race. We had plenty of time to chill out, lie on the sandy beach and bask in the sun - a delightful departure from what we had experienced in the past few months. ☺



More JO event reports and presentation files can be downloaded from [http://www.hkis.org.hk/hkis/html\\_jo/index.jsp](http://www.hkis.org.hk/hkis/html_jo/index.jsp)

# Surveyors Take Heart of the Lesson in "Infernal Affairs"



Reported by Kenny CHAN

## PQSL Event Report

### *Practising Ethics - Effective Defence Against Corruption*

Date: 17 May 2003

Speaker: Ms Jodi Leung (ICAC)

The movie "Infernal Affairs" hit the box office last year with its struggles on the values of right or wrong. The undercover fell into the grey area of the battle between black and white. There may be no undercover in our workplaces, but surveyors could fall into similar ethical dilemmas every day!

Surveyors enjoy the trust and respect from society

as professionals. We have the power to make professional judgements that could make a difference for projects involving billions of dollars. At the same time, traps and temptations are everywhere around us. We have to deal with different parties, but we may fail to identify who is the angel and who is the devil. How can we safeguard ourselves?

In this PQSL event, Ms Jodi Leung from ICAC has shown us the shield to protect ourselves from traps - Professional Ethics. Ms Leung had rung the bell to alert our future professionals the importance of ethics and some issues of concern to surveyors. She explained the Prevention of Bribery Ordinance (Cap. 201) (PBO) and some legal definitions to give us the concept of what is "bribery" in law. She advised us to observe the HKIS Rules of Conduct and the relevant policies set up by employers, and

to comply with these fundamental requirements.

In addition, Ms Leung gave us some ethical tips to avoid conflicts of interest through discussions on different scenarios. For example, we should avoid receiving advantages from people with business connections without permission. We should be aware of any possible unethical situations around us and report any suspected corruption cases. Whenever we are in doubt, we should actively seek guidance from employers, clients, the HKIS or ICAC.

Ms Leung concluded that the most effective tactic to stay away from corruption is to maintain our highest level of ethics and to stay alert. We gained a lot from this inspiring seminar and learnt how to deal with the "Surveyor's Affairs".

*The HKIS-ICAC e-learning package on Professional Ethics: <http://www.hkis.org.hk/hkis/icac/index.jsp>*

*Fellow members and students are encouraged to go through the entire quiz at the end. A successful attempt will gain one CPD hour with an e-mail record sent to the HKIS office. ☺*

## JO Forum 4

## Sharing Trade Secrets



Reported by Kelvin NG  
and Danny Cheung

Participants in the JO Forum 4 held on 7 June took home a few trade secrets with them. Four presentations shed valuable insights of property strategies in a wet market, fast-food chain, telecom property and property acquisition in Shanghai.

The Housing Department is the largest wet market landlord in Hong Kong. Few know the rules of how they devise the wet market layout and set out the rental level for each trade category. Jean Cheng of the Housing Department, the first presenter, shared the trade mix formula for a thriving wet market, the procedure in tendering out a market stall and the rental figures.

Following Jean's presentation, Mandy Wong of McDonald's property department presented the Big Mac's recipe of shop acquisition. McDonald's operates 200 retail outlets and a 9-year lease term is one of their leasing prerequisites. Unlike other retailers, Mandy says, McDonald's invests heavily for each new store and it makes economic sense to demand a long lease term to pay back the substantial capital outlays. Interestingly revealed by her, McDonald's property team has cleverly leveraged this unique leasing requirement and their corporate brand name to gain an upper hand in tenancy negotiation with landlords. With a seemingly bottomless marketing budget, each McDonald's store plays a retail magnate role in the locality, which means they can draw more shoppers than other retailers can do and their presence can enhance the retailing scene - a tenant quality each landlord would dream for. As a result McDonald's enjoys some tenant perks - instead of vying for premises, they are offered with shops of prominent frontage and sometimes, attractive leasing terms from many landlords. But McDonald's places a stringent requirement on shop selection and Mandy presented a case study of their recent site acquisition in Hung Hom.

While revealing the strategies of telecommunication companies in acquiring

mobile base stations, Raymond Tam of Sunday Mobile, took the opportunity to bash some of the current market practice and land policy that stifle the competitiveness of the telecommunication industry. Despite the fact that mobile fees have dropped substantially in the past several years, some landlords are slow to reduce the licensing fees. Unfriendly planning policy is also one hurdle they encounter in site acquisition. According to Raymond, the current provisions in the outline zoning plans have not given due consideration to the requirement of the telecommunication industry. We heard one good news in Raymond's presentation: a property profession dedicated to the telecom industry is emerging in Hong Kong. They are conversant not only with property knowledge but the technical details in the telecom industry. He expects that more young surveyors like him will be drawn to this growing industry.

Our final presenter was Tony Dong of DTZ Debenham Tie Leung. Tony came from Shanghai and worked for a Shanghai developer owned by a municipal government. He is now on a secondment to DTZ for one-year property training. Since mid of last year, all land lots must be sold by auction in Shanghai. But apparently some foreign developers have found other means to acquire land, mainly through a rather complex corporate share transfer mechanism, Tony said. Although spending a considerable time to explain how the mechanism works, Tony also explained in great detail of the risks behind this acquisition strategy. Tony's presentation gave us a glimpse of Shanghai land and property market.

There was a lively discussion from the audience after each presentation, much thanks to the great efforts by our two forum moderators - Mr Tony Tse, HKIS Senior Vice-President and Mr Ronald Cheung, JO Secretary. Their sharing helped uncover other pertinent issues missed in the presentation.

The JO recognises the jobs for surveyors are growing in diversity and in sophistication. Young surveyors have been playing a pivotal role in expanding the surveying profession frontier, from traditional strongholds in valuation, land administration and rating assessment to leasing

management, property and facility management, PRC market to new industries. The JO Forum specifically supports our young surveyors by providing a forum for them to speak out and share market knowledge. Should you wish to be our next presenter, please contact the forum moderator at [jimmyip@hkis.org.hk](mailto:jimmyip@hkis.org.hk).





The word "Land survey" has given many people a misleading concept that land surveyors work only on land and deal with maps, land boundary matters or construction works. In fact, land surveyors also work underground in tunnels and mines, on and in the oceans, and even in the sky!

Photogrammetry is a specialised surveying technology for spatial data collection. Land surveyors and photogrammetrists use photographs taken from the sky using balloons, kites, pigeons, aeroplanes, and spacecraft for a wide range of applications. The most popular one is map production.

Photogrammetry is not something new at all. The history of photogrammetry can be traced back as early as 1492. Leonardo di Vinci started his works on the perspective and central projections, which are the foundation of mathematical models of photogrammetry. In 1827, Joseph Nicephore Niepce took the world's first photograph. Twenty-two years later, the "Father of Photogrammetry" - Colonel Aime Laussedat of the French Army Corps of Engineers first used terrestrial photographs to produce maps. The evolution continues with the advancements in photography, aviation and information technology. The development of modern photogrammetry has made revolutionary impacts on mapping and surveying.

With aerial photographs, we can get both horizontal and vertical position of features on ground. It may be surprising that 3D information can be extracted from 2D images. How could we get the third dimension? Using a single photograph taken in a birds-eye view from the sky, we can already sense the elevation by relative sizes of different objects and the lengths of their shadow. However, if we have two photographs taken sequentially along a

flightline with overlapping and arranged correctly, we could create a stereoscopic view. When we are observing the two photographs using one eye for each photograph, our brain will interpret the images formed at each eye and fuse them together with exaggerated vertical relief.

The vertical exaggeration can be quantified since a particular point on ground will appear in different locations on the two photographs taken, and the offset of the image points along the flight direction (or what we called x-parallax) will be related to its elevation. We can hence measure the x-parallax to derive the elevation using photogrammetric mapping instruments. By establishing the geometrical relationships between the ground coordinate system and the image coordinate system, we can derive the 3D coordinates of features in the overlapping area. We can extract the spatial information as if we are carrying a survey in the frozen world inside the photographs to produce maps and other products.


Aerial photogrammetry has become the foundation of modern mapping. We can produce not only traditional plans and maps, but also orthoimages, digital elevation models (DEM), 3D visualized building models, and virtual reality environments for GIS. Just compare the coverage of a single aerial photograph and the area can be mapped by traditional surveys, you will know how photogrammetry has improved the productivity for land surveyors.

Apart from topographic mappings, monitoring projects can be done with photogrammetry. The Loughborough University, UK, has adopted photogrammetric methods to monitor the landslide of the Black Ven in Dorset, a famous site for earth scientists. The technique was tested and developed by measuring historical or archival photographs of 50 years and derived dated DEMs to show the changing morphology of the landslide through time. Over 1 million of coordinates can be measured by using automated DEM technology. The project has provided an episodic landform change model presented in the form of animations, visualizing the changes for everyone.

In Hong Kong, the Civil Engineering Department

is implementing aerial photogrammetry, together with other latest survey technologies such as multi-beam echo-sounding systems, GPS and 3D visualization, to monitor marine structures. It is proven to provide survey results with high reliability and efficiency. In the Lands Department, historical aerial photographs are often used as reliable evidence of occupations to solve land boundary problems. Map details are also updated using the regularly taken aerial photographs covering the whole territory.

Besides aerial photographs, photographs obtained from or near the ground level can also be used to provide 3D information using similar concept. This technique is called close-range photogrammetry. It allows measurements to be taken at almost anywhere in a non-intrusive manner, provided that photographs could be taken. For surveyors, we no longer need to access dangerous places such as cliffs or unstable landslides sites. It has also been used commonly in diverse applications other than surveying such as statues re-engineering, accident scenes reconstruction for investigation, aircraft and ship building, architectural and archeological studies, microscopic modeling, medical surgery...etc.

If a picture says more than a thousand words, photogrammetry makes it more than a million. 

# Fractured Land Lot

## A detailed report on the boundary survey of Lot 157S.B. RP in DD91



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Managing Director, Leung Shou Chun Land Surveying Consultants Ltd

### Background

This land boundary professional technical report reveals two sides of the phenomenon. A land surveyor has to exercise meticulous caution and effort in finding out the exact position of a lot boundary and it also reflects that many land lot boundary records in Hong Kong, particularly in the New Territories, are inadequate.

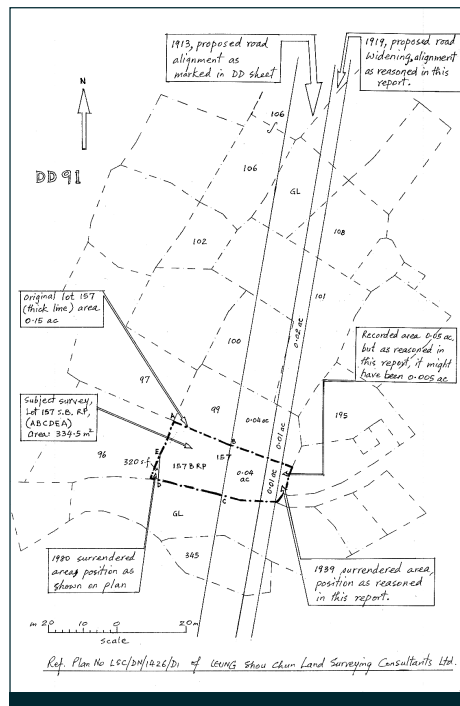
The captioned lot was surveyed in September 2002 in the normal manner and the boundary shown in Figure 1. The area was defined as 334.5m<sup>2</sup>. By the end of October 2002, the client expressed his worry on two, but related, aspects of the lot definition:

- How to account for the excessive area as compared with the registered area of 174.0m<sup>2</sup> by deduction, and
- As this Lot 157 had been subjected to several surrender/resumption exercises, would there be an overlooking of one of the surrendered area thus helping explain the above area difference and making our boundary definition doubtful, particularly the western one, i.e. boundary DEA in our above said plan?

While the surveyor was confident in his survey, he did take note of the above queries and carried out a review of his boundary determination. He extended the record search to other nearby Lots and studied the qualities of the past plans and documents. As could be seen from below, the findings confirmed that the determination was indeed correct.

### The surrendered portions

The original Lot 157 was registered in the Block Crown Lease as paid and of an area 0.15ac. It was shown in the DD sheet as more or less rectangular in shape. A pair of parallel lines was added on the DD sheet. This should represent a proposed road at that time which ran through Lot 157 as well as other nearby lots.



Lot No.	Memorial No.	Area surrendered
99B	42538	0.01ac
101B	42860	0.02ac

In 1913, a portion of Lot 157 stated as 0.04ac was surrendered to the Government via memorial No. 23040. This must correspond to the area for the proposed road as mentioned above. No designation of this surrendered portion could be found on record, but as the remaining split portions (still forming a single lot) were designated as Lot 157S.B, the surrendered portion might be presumed as Lot 157S.A.

In 1919, from Lot 157S.B, an area of 0.01ac was surrendered to Government via memorial No. 42609. Unlike the 1913 surrender exercise, this 1919 exercise generated neither plans nor markings on the DD sheet to show where the surrender was taking place. Many records of nearby lots were investigated and it was found that the surrender exercise involved not only Lot 157S.B but also the following immediately adjacent Lots.

It seemed to be rather certain that this 1919 surrender exercise was a continuation of the 1913 exercise of acquiring an additional strip of land along the original road alignment. Whether this land strip was to lie on the west or on the east of the original road was silent in the document. Incidentally, Lot 100 was not affected by this surrender exercise. Such a situation provided the

important clue that the land strip must lie on the east side of the original road which Lot 100 no longer covered. That the areas contributed by Lots 101, 99 and 157 in the ratio of 2:1:1 also supported this reasoned location of the land strip.

In 1939, a third surrender exercise took place. Lot 157S.B was to surrender 0.05ac to the Government via memorial No. 106423. This time, again, no plan to show the location of the affect area was available. The surveyor was left at a loss of knowing where the surrendered portion should be. By applying the same investigation technique as above, the information of lots affected by this 1939 surrender exercise was obtained as follows: -

Lot No.	Memorial No.	Area surrendered
99B	106434	0.04ac
101C1	106445	0.11ac
108B	106469	0.03ac

The involvement of Lot 108B served as the clue to indicate that this 1939 surrender exercise must be taking place on the east side of the road. In this connection, it might be noted that Lot 108 was seemingly not affected by the 1919 surrender exercise, but this was explicable as an area of 0.05ac designated as Lot 108A had already been surrendered to the Government in the earlier year 1918 via memorial No. 39712.

In 1980, Lot 157B was subjected to a fourth surrender exercise. This time, the record was quite clear as shown by a drawing No. NDR12<sup>A</sup> that the exercise affected the western boundary of Lot 157B. By now, it was evident that Lot 157B had been cut out 3 times in the east and once in the west. The worry of our client as described in paragraph 1 (b) above could be dispelled.

### The area

As regards the area discrepancy, the explanation lies in the crudeness of area determination in the past documents. Starting from the DD sheet, the graphical area could be measured to be 0.141 acre as compared with the registered area of 0.15ac. For the first surrender exercise in 1913, the stated surrender area was 0.04ac whereas the graphical area gave 0.036ac. So far, all these figures were consistent to within tolerance.

However, large discrepancies were to come. In the second surrender exercise in 1919 and the

third in 1939, no plan was available but both could be proved to be taking place in the eastern side of the Lot as discussed above. As could be seen from the DD sheet, the eastern portion of Lot 157 left behind after the first surrender would be very small. It measured graphically only about 0.016ac. However it should represent the combined area of both the second and the third surrenders, i.e. 0.01ac + 0.05ac or 0.06ac. This proved to be the single cause for the large area discrepancy. The last surrender of 320 square feet in 1980 taking place in the west was relatively insignificant. To summarize, the picture of the area evolution might be presented as follows: -

	Areas as stated	Graphical area
Original Lot 157	0.15ac	0.141ac
1st surrender in 1913	0.04ac	} 0.016ac
2nd surrender in 1919	0.01ac	
3rd surrender in 1939	0.05ac	
4th surrender in 1980 (320 sq.ft.)	0.007ac	0.007ac
Lot 157S.A (by deduction)	0.043ac	0.082ac
or	174.0m <sup>2</sup>	331.8m <sup>2</sup>

The Surveyor's present result as 334.5m<sup>2</sup> indeed agreed with the graphically deduced area, the few m<sup>2</sup> difference being the result of the rounding off of figures by working through use of different area units.

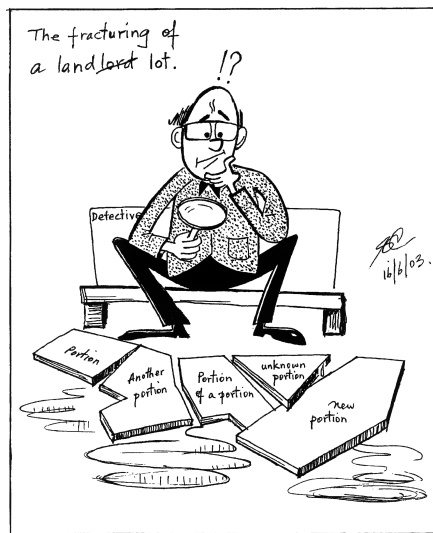
To double confirm the correctness of his determination, the Surveyor went through the positioning of the original proposed road alignment in 1913, the transferring of the same from one medium to another until the Lot Index Plan and was convinced that there was practically no error introduced. The western portion of Lot 157 as shown in the DD sheet remained virtually in the same shape and size throughout the history until it was now transformed to become the subject Lot 157S.B RP. The area discrepancy was introduced at source in the 1919 and 1939 surrender exercises. And the authority of this discrepancy must be the Government, neither the fault of the land surveyor nor the client.

### Analysis of the discrepancy

In order to satisfy one's own professional inquisitiveness, the land surveyor set forth on a further investigation of the possible cause of the large area discrepancy. It was noted from the memorial 106423 that in its fourth section, three areas were listed for surrender, being: -

DD 91 Lot No. 106A (.005ac) part,  
 " " " 107C1 (525 s.  
 f.) all, and " " " 157 B  
 (.05ac) part.

Based on a reasoned guesswork, it was surmised that the area for Lot 157B could have



been .005ac but was mistakenly written as .05ac. The practice of recording area to the nearest 0.01ac at that time did allow for the flexibility to extend to 0.005ac as could be evidenced from Lot 106A in this list and many other lots in other memorials. If the guesswork were correct, the difference of 0.045ac would fit very well to explain the present discrepancy.

### Conclusion and observation

The boundary determination as shown in Figure 1 should be correct. The surveyed area is a matter of fact. It being different from the registered area by deduction is incidental and could be ascribed to the inaccurate record of the surrendered areas. A possible cause was suggested in the paragraph above. If this area discrepancy is to be rectified so as to avoid future confusion, the client should bring the case to the Government (represented by the District Lands Office) for a rectification action. Being the authority to cause the discrepancy in the first place, the Government should be obliged to rectify the case.

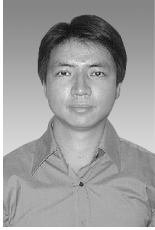
As to the observations, the author opines that this is a typical case highlighting the weakness of the land registration system and the incompetence of past Government officials that: -

(a) The designation of land Lot parcels was confusing. The area surrendered in 1913 seemed to have been reckoned as S.A and the remaining areas as S.B. No RP concept prevailed at that time. However, in recent days, the term RP was used. This change of practice may lead people to search for RP's in the past records thus causing abortive efforts. Further, all other areas surrendered successively in 1919, 1939 and 1980 were not given with any designation at all. The descriptive term "portion" to apply repeatedly to different "portions" and at different times was utterly neither non-

scientific nor systematic. This designation system is most disappointing and is one of the root causes of confusion.

- (b) The lack of plans compounded the land boundary problem further. The present case is a vivid example to show the damage caused by such a deficiency. Only through the land surveyor's extensive record search and analysis effort that uncertain locations could be determined. However the spending of such effort is most unwarranted. And naturally the question of who should bear the cost for such a spending is an open question.
- (c) The careless manner of determining areas is most deplorable. The eastern portion of Lot 157 beyond the proposed road alignment in 1913 could readily be seen as a very small area. Even a mere visual reading could tell that it was less than half of what had been surrendered for the proposed road. As the latter area was only 0.04ac (graphically 0.036ac), the eastern portion must be less than 0.02ac. Yet the stated areas became 0.06ac (being 0.01ac in 1919 plus 0.05ac in 1939). Whatever rough estimation should give a closer figure than this. Perhaps this error might reflect not only an initial wrong entry but also a weakness in the checking system, if any, at all. [13]

# Non-stop Automatic Deformation Monitoring System (ADMS) for the Interchange of KCR and MTR - the KCR Kowloon Tong Station



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## Background

Hong Kong is proud of its efficient railway systems, which transports people around the busy and overcrowded territories. One of the major contributors, Kowloon Canton Railway Corporation (KCRC), has operated in Hong Kong since 1979 and provides services to more than 1 million passengers a day. With more than 210,000 passengers travelling through the Kowloon Tong Station daily, this station has proven to be one of the most pivotal gateways of the KCRC (see Fig. 1). In this station, passengers can interchange with the Mass Transit Railway (MTR) or other public transport, which further increases its importance. Following the Ma On Shan Rail, which will come into operation in 2004, soaring demands from cross-boundary passengers are expected. In order to alleviate the increasing usage, a new underground concourse is under construction and excavation works have been commenced since August 2001.



Fig. 1 Kowloon Tong Station monitoring area

This new concourse, expected to be finished at the end of 2003, would provide more than 1,800 square metres space, which extends the existing station by 20%. To cope with this substantial development, a subway would be constructed underneath the existing railways. It is therefore vital to monitor the existing railways for any deformation, which exceeds the predicted design values while tunneling and excavation works proceed.

As one of the foremost instrumentation specialist in Hong Kong, Foundation Techniques Ltd was appointed to conduct this complex and sophisticated task. It was considered that the

potential movements of the tracks should be monitored by a real time system so that any probable disaster can well be predicted beforehand.

## Monitoring System

### System tools

To accommodate this sophisticated vital task, Leica Geosystems' products including Leica's APSwin software and a telemetry link to their TCA 2003 automatic total station were selected. APSwin software is a control and analysis package capable to acquire three dimensional data with an automatic total station equipped with Automatic Target Recognition (ATR). Users can use this software to control the number, sequence and frequency of measurements to any number of observation points, the approximate positions of which have been previously stored. Totally, two Leica TCA 2003 automatic total stations with more than 120 prisms were purchased. The automatic total station is claimed to provide 1mm distance measurement accuracy with an angular accuracy of up to 0.5 second.

### System Design

The next critical issue was the locations for the installation of two total stations. The initial intention was to install them beneath the platforms as this could prevent them from disturbance. However, as the reduced level of the upline track is higher than the downline track, the visibilities of some prisms would be blocked. Therefore, more total stations would need to be purchased and this would eventually increase the cost of the system (see Fig. 1). Finally, two new cantilever stands were erected at the end of the existing platform so that the two total stations could observe all the prisms mounted on the track sleepers in a higher elevation (see Fig. 2).

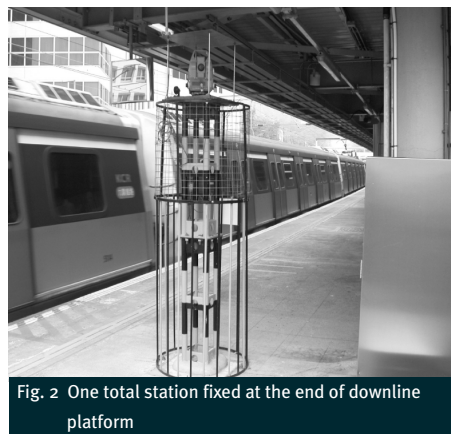


Fig. 2 One total station fixed at the end of downline platform

For the concerned area immediately above the subway zone, a total of 100 mini prisms were installed on the track sleepers that mounted to the rail tracks. The movement of the sleepers indicates the movement of the tracks (see Fig. 3).



Fig. 3 Prisms mounted on the track sleepers

Backsight mini prisms were installed on the external wall of the nearby buildings (e.g. the Hong Kong Productivity Council Building) for checking the stability of the total stations during system operation (see Fig. 4). Besides, prisms were also attached to the total stations' cantilever stand to enable measurements to be taken between total stations to check their stand positions.

The total stations were linked to the APS win control computers through two 150m RS232 cables. Line drivers were used for data transmission and UPS were adopted as backup power supply for the total stations and the computers. The system completes a cycle in a regular interval and APSwin software produce the results both in graphical and textual formats. The deflection differences from the x, y and z values are then computed by an in-house developed program and make comparisons with the trigger values. Engineers would be automatically informed if a tolerance is matched or exceeded so that preventive actions can be taken.

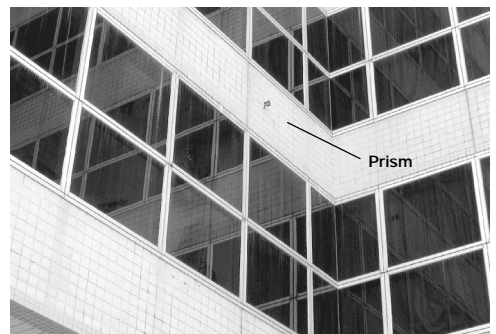


Fig. 4 Backsight prism mounted on the external wall of the nearby building



## Problems Encountered

### Budget, time and site constraints

Budget, time and site constraints are long believed to be the most three significant parts of a project. With the primary aim of saving costs, only two automated total stations were used. For the locations of the backsight prisms, we planned to mount them on the external wall of nearby buildings rather than constructing concrete pillars that would significantly increase the installation cost. The basic principle was to maximize use of the existing resources to accommodate with the monitoring scheme.

Meeting a tough deadline is another critical issue. With track possession of only three hours per night, we had to plan the installation work thoroughly in order to finish the installation work on time. Close liaison with the engineering profession and site staff were key factors to meet the construction schedule.

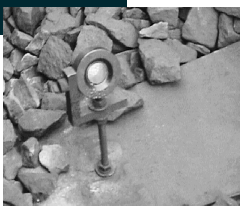
Spaces were limited especially in this congested railway station. It was hard to find a place to ensconce the two total stations without the interference of the passengers. After several alternatives were taken into account, the end of the railway platform was selected. The locations of the signal cables and other reference points were fixed with the consent from the KCRC to avoid unnecessary interruption.

### Vandalism

In an open area, disturbances seem to be unavoidable. Prisms were frequently dirtied by dust or oil dropped from trains. Therefore, regular cleaning and maintenance of prisms were essential (see Fig. 5). By producing motorized sounds, the automatic total stations always attract the attention of many curious passengers. Fencing the supporting columns of the total stations was necessary.



Fig. 5 Regular cleaning of prisms



## Benefits of the System

### Non-Stop monitoring

The biggest contribution of ADMS to our survey industry is its automatic and non-stop functioning features. Compared with traditional survey, the system acquires continuous monitoring data 24 hours a day, seven days a week with few human interactions. These continuous monitoring result data form an integral part of the engineering analysis and give essential warning messages to routine train operations.


### Confidence

The extent of human errors was dramatically reduced as the instrument takes the readings by itself. With the ATR technologies, the total station automatically detects the position of the prisms. No illumination is required since the total station transmits laser beam and receives the beam by its built-in camera (CCD). All one has to do is to ensure the prism is always facing towards the total station.

### Cost saving

Despite having to make investments in such innovative equipment at the beginning stage, the system would give you a sizable return very soon. The system switches our monitoring task from labour intensive to fully automation resulting in significant diminution in labour cost and other operation expenditure. Money can then be endowed in enhancing the existing system or other advance survey techniques.

## Conclusion

This automatic deformation monitoring system was developed for the KCRC Kowloon Tong Station Southern Concourse and Subway project. The success of this monitoring activity has demonstrated the ability of the latest automatic survey instrumentation, controlled by extraordinary monitoring software, producing fast and accurate results on a shoestring (see Fig. 6). Action speaks louder than words. It is also an exercise which revealed the development potential of innovative survey techniques in various Hong Kong major infrastructures projects. 

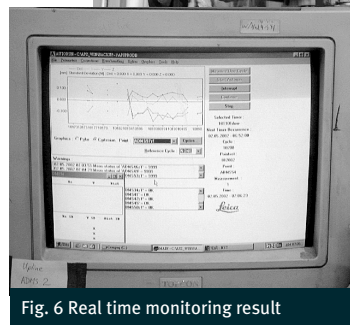


Fig. 6 Real time monitoring result

# Advances of surveying technology - a threat and opportunity to land surveyors



**K**eeping up with technological development in surveying science, land surveyors witness rapid improvement of our measuring equipment, and it is not just in data acquisition but also the processing, analysing and presentation devices. This is a phenomenon of globalisation such that new high technological devices are coming into the market while the traditional small area surveying and mapping tools are getting more popular and economical.

The popularised surveying technology leads to improved productivity and increased competition. Free trade at an international level is thus a chance as well as a threat to surveying firms. At a local level, the highly automated surveying tools are operated by less trained non-professional personnel. The traditional engineering and cadastral surveying business have been hard hit.

While the majority of land surveying firms in Hong Kong is providing traditional cadastral and engineering services, some of the firms have started venturing into GPS and GIS business. Heavy cost of technological and financial investment is of course a threat as well as an opportunity, however, it does not mean that jumping into the GPS and GIS business is a sure way of survival. The crux is the ability to suit the changing market needs. Just like animal species in revolution, only those who can adapt to the changing environment will eventually survive.

Technological impacts to land surveying industry are probably first seen from the university. The name of the Department of Land Surveying and Geo-Informatics clearly indicates that in the industry we now have the traditional land surveying realm in cadastral survey, engineering survey and mapping, whereas the Geo-Informatics represents the new development in 3S - GPS, GIS and Remote Sensing. The term "Geomatics" collectively


describes the acquisition, processing, analysis, storage and application of spatial data.

With the new appearance of terrestrial and spatial surveying technology, there is a trend for a university to include them in the syllabus and for a land surveying professional organisation to incorporate these new tools and their personnel into its realm. For example, the Institute of Surveyors, Australia, which used to be a land surveyors' professional organisation, has merged with other mining surveying, mapping and GIS institutions to form a larger Geomatics national-wide organisation - the Spatial Sciences Institute. And, The American Society for Photogrammetry and Remote Sensing (ASPRS) has officially incorporated the tagline 'The Imaging and Geospatial Information Society' since 1998, which reflects the shifting of roles from primary data acquisition to data extraction and decision support.

The 3S assume an increasingly significant role in our traditional surveying practices. Singapore is a good example of harvesting the technological advantages from GPS. The geodetic network in Singapore has been upgraded. Accordingly, the law of Boundaries and Survey Maps Act has thus been amended and the Singaporean survey department proudly stepped forward to declare the coordinated cadastre. Land boundary right is thus technically described by current surveying means and legally protected by law.

GIS has acted as an integrating technology as well as a competing technology in the survey and mapping industry. Maps and plans are limited to present information whereas GIS is venturing into the functions of spatial analysis, visualization, database design and implementation, and land administration decision support. While other advanced countries have already established policy and making progress in their national spatial data infrastructures, it is nice to hear that our Lands and Works Bureaus have started looking into our own land data problem.

Another fast developing mapping tool, LiDAR, which stands for Light Detection And Ranging, is used in airborne laser mapping. Needless to say, the technology is not yet perfect, but it is just a matter of time that by a flight passing the land and a 3D model is readily available on your

computer. If our tools were only limited to total stations and PCs and our product plans and maps, life would get difficult day after day. We not only need new tools to do old jobs, but also to find new tasks which our society needs. 

# Two Land Registration Systems in Parallel Running

## *With this new feature, would Legco this time support the Land Titles Bill?*



**Jim YIP**  
MHKIS, MRICS  
Senior Manager, Valuation Advisory Services,  
Jones Lang LaSalle

*This is the land. We have our inheritance.*  
-T.S. Eliot

### Introduction

The Government has long been trying to reform the current land registration system. Back in 1994 it first introduced the Land Titles Bill ("The 1994 Bill") which proposed a midnight conversion of the deed registration system to a title registration system.

However, the 1994 Bill lapsed in the Legislative Council in 1995. On 26 November 2002 the Government re-introduced the Land Titles Bill ("the 2003 Bill") with a new feature of gradual conversion mechanism. Currently, the Bills Committee is scrutinizing the Bill.

Although the 2003 Bill have addressed some concerns raised on the 1994 Bill, there are still various overriding issues including land boundary, the indemnity cap, and the principle of indefeasibility of title and overriding interests.

Adopting the discussion frameworks in various documents submitted by the Government to the Bills Committee, the first part of this paper would outline the gradual conversion mechanism, the effect of first registration and the benefits of the title registration. The second part will elaborate the major arguments in the 2003 Bill. Examples of the curative effects of the 2003 Bill are also illustrated.

### The Conversion mechanism

The Bill sets out the three routes through which a property can be converted from the deed registration to the title registration system.

#### 1 Application on first sale

The first route is by an application for registration from the purchaser upon the first sale of the property after implementation of the title registration system. This will be mandatory.

The vendor will be required to disclose all overriding interests (see Fig. 1) of which he has or ought reasonably to have knowledge. The purchaser's solicitor will have to examine the title to the property.

Where the solicitor finds that the vendor has good title to the property, he will issue a certificate of good title that will accompany the application for registration of the transfer, together with the notice of overriding interests, if any.

If all is in order, the Land Registry will approve the application and bring the property onto the title register.

If the solicitor decides that he cannot issue a certificate of good title, he will notify the Land Registry of this. The assignment will be delivered for registration under the Land Registration Ordinance together with a solicitor's certificate to the effect that he has examined and found that the owner does not have good title to the

#### Examples of overriding interests include:

- ▶ Right of way
- ▶ Chinese custom or customary rights
- ▶ Short-term tenancies
- ▶ Rights of adverse possession
- ▶ Statutory rights for resumption.

Fig. 1

property.

#### 2 Application on issue of new Government Lease

The second route is that the Government lessee must apply for registration of his title on issuance of a new Government lease after introduction of the title registration system.

No certificate of good title is required. A new title register will simply be opened for the new lease.

#### 3 Voluntary application

The third route is for an owner to make a voluntary application for transfer. This may be done at any time after implementation of the Bill. Any such voluntary application must be accompanied by a certificate of good title, issued by a solicitor after examination of the owner's title to the property.

Properties which are not brought under the title registration system remain on the deed registration system. In the Legislative Council Brief, the Government said they would revisit the idea of automatic conversion some time after title registration has been introduced and when people become accustomed to it.

### Special features of title registration

Upon registration, the person entered as owner or lessee in the Title Register holds the property free of any interests except those specifically allowed in the Bill. The interests, whom the Bill allows, are:

- (a) The terms and conditions in the Government lease;
- (b) Any registered matter affecting the land;
- (c) Any overriding interest (see Fig. 1) affecting the land; and
- (d) In the case of an assignment not for value or a voluntary application, any unregistered interests (see Fig. 2) affecting the land existing immediately before the date of the first registration.

#### Examples of unregistered interests include:

- ▶ The provisions of the Bankruptcy Ordinance (the trustee in bankruptcy may apply to the Court to set aside the transfer if it is an unfair preference given by a bankrupt to the transferee);
- ▶ Part V of the Companies Ordinance (a fraudulent preference by a company made within the six-month period prior to winding-up will be invalid);
- ▶ Section 33(9) of the Buildings Ordinance (the first charge in favour of the Building Authority for the recovery of the costs of building works carried out by the Authority)

Fig. 2

## Benefits of title registration

The primary advantage of a system of registered title is that the Register has an authoritative role - one that is nearly conclusive - in the system of conveyancing. The only significant exceptions to the "finality" of the Register are overriding interests and the provisions for rectification.

Notwithstanding these exceptions, the purchaser no longer has to investigate numerous previous transactions to find out the nature of the title being offered and can assume that the documents registered in support of the current title are valid and effective. This should lead to fewer disputes as to whether title has been established and less actions for breach of contract.

In addition, each act of registration has a curative effect. Once a property has been brought onto the title register it will be safeguarded against the defects that can accumulate against the chain of title under the existing deeds registration system. (examples shown in Table 1 below)

### Curative effect of the conversion

First registration has the following curative effects:

#### (a) Mistakes in the existing register

The Land Registry will examine all the current entries on the Land Register kept under the Land Registration Ordinance and exercise care in entering such entries on the new Title Register. Any mistakes on the existing Land Register should be rectified in the Title Register. In addition, the Land Registrar will be empowered under the legislation to make subsequent rectification in the Title Register for these mistakes in case of non-material errors or omissions or with the consents of all interested persons in any other case.

#### (b) Equities and unregistered interests

They are unenforceable against the land if the assignment is for value. They are only enforceable against land if the assignment is not for value or in the case of voluntary application.

#### (c) Overriding Interest

The vendor - or the owner in a case of voluntary application - is required to give notice of all known overriding interests. This will be recorded in the Title Register for future reference. The type of overriding interests that can be allowed to affect a property is defined and limited in the Bill.

### Circumstances where the Director of Lands shall not make a determination of the lot boundary:

- ▶ Other persons other than the Government have subdivided the lots.
- ▶ The lots are held under a block Government Lease.
- ▶ If the boundary plan changes the boundaries or area or measurement of a land boundary plan in the land title record or any Government lease.

Fig. 3

## Major arguments on the Bill

### Land Boundaries

Similar to the existing deed registration system, land boundaries will not be guaranteed under the 2003 Bill. Although this provision is not different from the 1994 Bill, an additional provision is included in the 2003 Bill: the landowner may apply to the Director of Lands to have their lot boundaries determined and registered in the Land Registry under certain circumstances specified in the Bill. (see Fig. 3)

The major reason that the Government does not propose to provide any form of guarantee for land boundaries is that land boundary surveys conducted since the establishment of the Geodetic Datum in 1980 covers less than 10% of all lots.

In the Legislative Council Brief, the Government stated "as the number of properly surveyed lots in Hong Kong are built up in future, the Administration might revisit the issue and consider providing a guarantee of land boundaries in due course."

The Hong Kong Bar Association agrees with the proposal that leaves boundary disputes to be dealt with outside the title registration system.

However, the HKIS holds a different view. In its response paper, it argues that "it is most important that the title registration system should provide reliable and adequate records about the particulars of the landed interest including a plan showing the size, boundary and layout of the interests." (the full response paper can be viewed at [www.hkis.org.hk](http://www.hkis.org.hk))

### Indefeasibility of title of purchaser

One of the main features of the land titles registration system is to provide security of title. Under the 1994 Bill, the Land Register would not be rectified so as to affect the indefeasible title

of the innocent purchaser even in the event of a fraudulent transfer of property achieved through the fraud of a third party. The Government would indemnify the innocent original owner up to a limit.

Such proposal differs from the arrangement under the existing deed registration where an innocent owner cannot be deprived of his property by reason of a fraud to which he is not a party.

There was a strong opposition to this proposal from the landowners back then. And they called for the principle of indefeasibility of title to be diluted to protect an innocent former owner defrauded of his ownership.

As a result, under the 2003 Bill, the Court will be given the power to order rectification of the Register.

The Court may take into account two criteria - the acts of the parties and the hardship to the parties when considering whether to rectify the title register where a fraud has occurred.

For "acts of the parties", the Court might include the acts committed before and after the change of property ownership. For "hardship to the parties", the Court might consider the hardship caused to the parties by the loss of the ownership of the property in question.

In its response statement, the Law Society urged the Government to limit the grounds on which the Court can order rectification.

The Real Estate Developers Association is concerned with the rectification consideration based on the hardship level that each party would suffer with the loss of title. It said "Hardship is a relevant consideration for the Court in deciding whether the Register should be rectified, a party who is financially stronger will, more likely than not, lose out. At the end of the day, all other things being equal, it may come down to the simple question of 'who can afford to lose out?' We are afraid that this cannot be right and equitable."

The Government does not favour the proposal of automatic restitution to an innocent owner defrauded of his property. The reasons it cited were:

- ▶ Giving the Court the power to consider restitution to the former owner already weakens the protection given to an innocent purchaser, and derogates from the principle of indefeasibility of ownership.
- ▶ It would be unjust to remove all protection for an innocent purchaser.

## Indemnity

The Bill provides an indemnity scheme for people (either a former owner or a new buyer) who suffered loss by reason of an entry in or an omission from the register, as a result of fraud, mistake or omission by a third party.

There are two indemnity schemes. If the loss of title is due to negligence of the Land Registry staff, the Government will guarantee to pay full indemnity. Whereas if the loss is due to fraud by any person, the maximum indemnity guaranteed by the Government is limited to \$30 million per claim. In the 1994 Bill, the indemnity cap was \$20 million.

The reasons put forward by the Government for the indemnity cap were:

- ▶ The indemnity scheme was designed to be self-financing. It should be funded by the users of the land title registration system. The interest of individuals being compensated should be balanced against the costs to property owners and purchasers at large.
- ▶ Deliberate fraudulent acts are difficult to anticipate and prevent. The Government would be the compensator of first resort. There should be a suitable device to limit the potential liability that the scheme has to carry.
- ▶ The spirit of the scheme is to protect those most in need, i.e. the average flat owner. The current indemnity proposal has covered 99.6% of transactions made in 2002.
- ▶ The owners of high-value properties would not be deprived of the means to recover their losses in case of fraud. Persons suffering loss in excess of the limit of compensation could still through further legal proceedings try to recover the shortfall.

The Real Estate Developers Association takes the view that the Bill, in so far as it attempts to deprive an innocent owner of his property without full compensation, is contrary to the Basic Law

In particular, it argues that the placing of a limit on the amount of indemnity is contrary to Article 105 of the Basic Law which requires that compensation for lawful deprivation of property shall correspond to the real value of the property concerned. It suggests removal of the cap.

It cited that neither the United Kingdom, Australia nor Canada, which adopt title registration system, places a limit on the indemnity.

## Conclusion

Compared with the present deed registration, title registration provides the owner greater

certainty of property title. It provides a better safeguard against defects on property titles. The new system can also simplify conveyancing procedures.

Compared with the 1994 Bill, the 2003 Bill has some improved features such as the gradual conversion mechanism, increase of indemnity cap, an addition of rectification system by the Court and a new avenue for landowners to have their lot boundaries determined by the Director of Lands.

The conversion mechanism which requires a mandatory conversion for all first sales and new Government leases and a voluntary application from existing owners is a prudent approach. It enables the public to have sufficient time to familiarize with title registration.

The proposal for the properties that have been chosen in the first phase of the conversion mechanism should meet little resistance from owners as they normally have the duty to deliver good title on property sale, no matter what registration system they adopt.

The 2003 Bill however is not without its drawbacks. An innocent owner may not be able to regain his property title in fraud cases, which is not the case in the existing deed registration system.

Moreover, under the indemnity scheme of the Bill, the owner cannot recover the full value of his lost property if the value is over \$30 million; however, the original owner can still sue through civil action.

While it appears that protection for registered owners offered by the land title registration system is less than the existing deed system in respect of fraudulent ownership transfer, one may argue that the title registration system offers a greater protection for prospective property purchasers. <sup>(5)</sup>

Issue	Treatment under Deed registration	Treatment under Title Registration
<b>Defective execution of important title documents</b> The most common example is where execution by a company in an assignment was attested by one director only whereas the company's articles of association provide for attestation by two directors.	This is a defect that, once it has emerged, remains in the chain of title. A potential purchaser has to make a judgement whether or not to accept a title that has such a defect.	The problem will not arise. Once a transaction has been registered no defect in the execution can affect the title. No subsequent purchaser needs to worry about them.
<b>Unwritten equities in favour of a third party</b> For example, a person who provides the purchase money for the owner has a resulting trust in the property.	The title is defective. A subsequent purchaser can find his title being affected by the claim even though it is not registered.	No unwritten, unregistered equities can be enforced against a purchaser for value. If first registration has been made after voluntary application or is a transfer without being for value, prior unregistered interests remain enforceable until there is a transfer for value.
<b>Defective power of Attorney</b> The holder of a power of attorney has not been clearly authorized to execute title deeds.	The title is defective. A subsequent purchaser has to consider whether to accept a property with such a defect.	The problem will not arise. Once the property has been registered, any possible previous defect in power of attorney can no longer affect the title.
<b>Stopped Deeds</b> These are instruments that have been withheld from registration under the LRO but have not been withdrawn or rectified by the originating parties.	These are defects on the title. Any subsequent purchaser will have to consider whether or not to accept the property in the face of the uncertainty raised by these deeds.	Stopped deeds will not exist. Any application for registration that is not rectified following requisitions by the Land Registry within a specified time will be removed.
<b>Undischarged mortgages</b> The concern is with old mortgages for which there is no record of discharge and uncertainty as to whether they have continued effect.	The property remains subject to the undischarged mortgage. There is case law where Courts have made declarations that old mortgages are no longer capable of having effect.	As well as the Courts having power to make a removal order, the Registrar will be able to remove registration of an old mortgage if he is satisfied that all monies have been paid.
<b>Discrepancies in signature and identification documents</b> The concern is with documents registered prior to the transaction in hand. If discrepancies are found in the current documentation they must be resolved before registration.	Any such discrepancies in documents remain as defects on title. A purchaser has to consider whether to accept the property when such uncertainties exist.	The problem will not arise. Once an owner has been registered, discrepancies in prior documents can have no effect on title.
<b>Ambiguity in wording of a will</b>	Ambiguity as to whether an executor has power to sell the property may affect the validity of the deeds. Any subsequent purchaser has to consider whether or not to take the property subject to such uncertainty.	The problem will not arise. Once an owner has been registered, any such ambiguity has no further effect.

Source: HKSAR Government

Table 1: Examples of the Curative Effects of the Land Titles Bill

# Part 2: Working With an As-Built Programme



The article published in March 2003 considered how to compose an as-built programme, the sources of data and presentation formats. This article considers exactly what an as-built programme is, what it is not, how to read it, making comparisons between as-planned and as-built situations, re-constructed as-built programmes and identification of the as-built critical path.

As-built programmes are usually composed for two purposes, firstly, to establish the as-built critical path and, secondly, to gain an insight into the extent and actual causes of delay, whether excusable or culpable, and the causes of those delays.

## As-built programmes: what are they?

An as-built programme is a programme which records the actual timing of as-built activities i.e. start and finish dates, suspension of work, actual sequences, etc. As-built programmes usually take the form of a bar-chart or gantt-chart, though they could be composed in any number of formats.

Other data which may also be recorded on an as-built programme includes the actual resources used and actual quantities or amounts of work carried out. Information such as the effects of certain architect's instructions or contractor's delay notices should also be recorded.

The as-constructed logic, i.e. the inter-activity linkage of predecessors and successors, is not ordinarily recorded in an as-built data base.

However, it should be possible, by deduced reasoning, to assess actual construction sequences and from that to introduce interactivity linkages. To draw firm conclusions about such sequences requires firm insight into how the works were actually constructed.

## As-built programmes: what they are not?

As-built programmes in themselves do not provide the reader with affirmative information such as why activities did not start on a planned date or why activities took longer to complete than originally programmed.

An aspect commonly sought from an as-built

programme is the assessment of the critical path. However, as-built programmes do not, contrary to popular belief, identify the as-constructed critical paths or identify critical activities unless the as-constructed inter activity linkages and sequences are input.

## What information can be gathered?

If prepared correctly, it should be possible to ascertain key facts such as project commencement and completion dates and achievement of contract key dates.

A common feature of as-built v programmed comparisons is that the activity durations for the as-built are usually longer than originally programmed. Does this mean that delay was caused to follow-on works? Not necessarily, as planned finish to start sequences are often changed into overlapping activities and although individual durations can be longer, the string of activities can be the same length or shorter. By examining actual progress of activities either side of the subject activity it should be possible to determine whether delay occurred or whether it was overlapping.

Turning to the question of the critical path. Where was the critical path? Which string of activities did the as-built critical path flow through? Has the critical path altered from that programmed within the previous month or at project inception to what actually transpired on site? These are all common questions asked from as-built programmes.

Armed with an as-built programme, an understanding of exactly how the works were constructed, a good source of data and/or the resources directly involved, it should be possible to accurately assess the actual critical path for a completed project, or if the investigations were carried out concurrently with actual progress, as the works proceed.

Most commonly, contract administrators solely concentrate on delays that occurred to activities on the critical path, rather than the works as a whole. This hypothesis is incorrect, since when dealing with extensions of time, entitlement to additional time is not related to the contractor's culpability, nor dominance of one delay over another delay, or one path over any other. Hence, assessing criticality of delayed works should not be relevant when assessing extensions of time.

For example, during the construction of a pipeline, the contractor suffers a plant breakdown and issues a programme to completion illustrating unrecoverable delay. The engineer then instructed a variation to the routing of a section of the pipeline, unconnected to the broken plant. It was

subsequently assessed that the variation did not impact on completion as shown in the contractor's revised programme. In this situation, late completion of the pipeline was directly dictated by the plant breakdown, not the varied works. However it is incorrect for the employer to impose damages for the full period of delay due to the fact that concurrent delay caused by the varied works would likely have caused unrecoverable delay to completion but of a shorter duration than the plant breakdown. Whilst the plant breakdown remained on the critical path throughout, the less critical variation works still entitled the contractor to an extension of time. Hence, assessment of criticality of impacted works upon the projected or actual completion date is not necessary when assessing entitlements to additional time.

## As-planned v. as-built comparison

A direct comparison of activities and events on the as-planned and the as-built programmes for the same works will provide an understanding as to how overall delay accrued on the project (assuming the project finished in delay).

In considering actual progress compared to the as-planned programme, establish a sequence of key points throughout the course of the project, each of which dictated commencement of follow-on works and could not occur until a certain portion of the project was completed. For instance, whilst considering a high rise building the following activity list may be derived:-

*Site possession;*  
*Ground breaking;*  
*Start and finish piling;*  
*Start and finish sub-structure;*  
*Start superstructure;*  
*Start wet-trades;*  
*Start lift installation;*  
*Start M&E;*  
*Start of curtain walling;*  
*Top-out the superstructure;*  
*Lift form 5 issue;*  
*Water tightness date;*  
*Start FSD and BD inspections;*  
*OP issue; and*  
*Practical completion.*

With the list of activities complete, record for each event the as-planned and as-built start and finish dates. Some subdivision of the planned activities may be needed for the as-built programme, particularly when the work becomes fragmented.

A direct comparison between planned and as-built shows the extent of delay at the chosen time. Where the project continued to suffer delay, an all too frequent occurrence, the increase or decrease in recorded delay will provide an indication as to the areas of the project where progress was as planned or delay occurred and how long the delays were.

The chart below illustrates a direct comparison of the as-planned and as-built programmes for a 10-activity project. The arrows indicate the increasing periods of project delay.

#### Comparison of As-planned and As-built programmes

##### As-Planned Programme

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

##### As-Built Programme

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----



Once a delay has been identified for a particular portion of the programme, or an aspect of the works, a more thorough examination of how the works were constructed in comparison to original planned intentions can be undertaken for that portion or aspect. By comparing the durations of activities in the planned and as-built situations, periods of delay can be identified.

At this stage it is useful to research and prepare a detailed as-built programme of all day-to-day activities of works associated with the delayed works. Having identified the as-built sequence of works it should be possible to assess the linkage between activities, or in other words, identify which activities preceded each other. Remember however, there is usually only one predecessor activity that actually drove the commencement of a successor though there may be many activities that preceded it.

Once the periods of delay have been identified, it may be necessary to investigate the causes of delay. If there are arguments concerning criticality and concurrent delays, it may be necessary to research the events that caused delay to the progress of the works.

When the investigations into causation are completed it becomes a matter of judgement and interpretation of the contract conditions whether culpable or excusable delays occurred and, where delays were excusable, whether such delays are compensable or non-compensable.

Admittedly, this technique is most suited to "straight-line projects" in which there were distinctive, unalterable sequences in which the works had to be constructed. More complex projects such as multi-faceted building projects, spread over

large areas, or those projects for which revised sequencing was always an option, may need to be considered by subdividing the project into smaller elements and considering these subdivisions individually.

In situations where the actual construction method employed altered so radically that the as-planned programme soon became obsolete, rather than a reasoned projection of the sequence of works, it may be necessary to re-construct the as-planned programme based upon a realistic approach. Although such a programme would be constructed in hindsight, it is possible to reflect how the works could or should have been constructed in a programme that adhered to all original contract requirements and programming constraints. Once completed, the process of as-planned v. as-built analysis can begin.

#### Re-constructing the as-built network

An as-built programme begins as a list of activities against which the actual commencement and completion dates are recorded. In order that the as-built programme can be used for forensic delay analysis, similar to the way in which networked as-planned programme can be examined by programming software, it is necessary to establish, and then apply inter-activity construction linkages between as-built activities.

Starting at the end of the project, or the subdivision under review, assess which activities preceded completion. In the first instance, one need only consider the preceding activities that proved driving, or near driving, to the actual timing of the particular activity being examined. Once linkage between activities has been established it is necessary to consider the period of lag between them.

For instance, where commencement of reinforced concrete columns was driven by the earlier construction of a reinforced concrete slab then the actual period between respective commencement dates, of say a period of 5 days, was to allow for completing construction and curing of the first segment of the reinforced concrete slab before commencement of reinforcement fixing for the column. This also represents the actual period of lag between the activities.

In the case of non-driving linkages, the actual period between one activity and the next does not represent the period of actual lag between them.

For instance, delivery to site of system formwork for the reinforced concrete column may have occurred 7 days prior to actual commencement of formwork erection on site. Though the period between delivery and erection was 7 days, the formwork

could have been erected into position immediately upon arrival at site. Hence, the period of activity lag should be 0 days, not 7 days.

This process has to be repeated throughout the whole programme, assessing, for each activity, the activity linkages.

When completed, assuming the as-built dates were already formatted into a computer based electronic data base, the percentage of activity completed can be set to zero, the planned duration can be set to the actual duration and all inter-activity linkages incorporated. Upon removal of the actual start and finish dates the programme is then re-scheduled thereby calculating the timing of all strings of activities based upon actual activity durations and linkages. Through manipulation of activity linkages the aim is to replicate the timing of all activities so that they match the as-built programme.

Once the computerised re-configured as-built programme is completed it can be used for forensic delay analysis in a similar manner to any other computer based networked programme.

Within the 'as-built but-for' (ABBF) method of delay analysis, a pre-determined list of delaying events and/or activities are removed from the networked as-built programme and the programme re-scheduled, to progressively remove the effects of the delaying events, i.e. 'but-for' their occurrence. For instance, in the event delivery of column system formwork was to occur 10 days later than planned, though only 3 days later than the progress of site works allowed erection of the formwork to begin, removal of the 10-day delay in delivery from the as-built programme would result in a shortening of the whole programme by 3 days. Hence, the delay caused by the late delivery of formwork would be 3 days not 10 days.

However beware, upon removal of the effects of a number of delaying events and/or activities from the networked as-built programme, re-scheduling will result in a wholly theoretical situation that never actually occurred or would have occurred absent the effects of the delaying events which were removed. Hence, the assumption that delay was caused by the effects of remaining delaying events on a theoretical programme could result in unimportant items being classified as critical when, all that actually occurred, was that non-critical activities were allowed to fill the available space in time (i.e. they consumed float).

Given the theoretical programme situation of an ABBF analysis, it is not correct to assume that the contractor would not have undertaken work differently absent the effects of critical delaying events. As the saying goes 'why-rush-and-wait'. This reflects the common practice in contracting that, given the knowledge that if one string of activities is in critical excusable delay, then there is little sense in rushing non-delayed works only to wait around until the delayed works catch up.

### Empirical checks

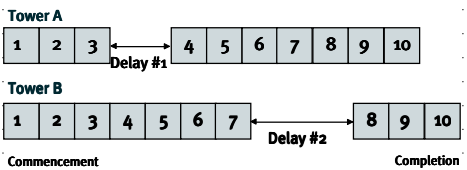
Once a networked as-built programme is re-scheduled within which the effects of a selection of delaying events/ activities are removed, it is essential to undertake an empirical check before drawing conclusions. For instance, if all delays associated with engineer's instructions were removed it would be necessary to review the collapsed ABBF programme, and consider how the contractor would likely have progressed the works. Within an ABBF analysis, each sequence of driving activities has to be scrutinised in order to ascertain its relevance given the wholly theoretical structure of such analysis. The measured-mile approach can be used to shorten remaining activity sequences, which were allowed to grow by consuming float as the contractor has proven an actual capability elsewhere on the project in relation to similar works. It is therefore incorrect to simply remove the delaying effects of certain events, re-schedule the

programme, and produce computer generated outputs without carrying out empirical checks to determine the realities of such outputs.

### Ascertaining the as-built critical path

The networked as-built programme will illustrate a critical path for the works. However, the critical path at the time when any particular delaying event occurred may not be the same as that which eventually determined completion of the project. These are often called "criticality shifts". For instance, consider a project comprising construction of two identical towers, A and B, both 10 storeys high. The contractor planned to construct both towers at the same time, commencing and completing them together. Initially, progress was unhindered and both towers progressed at a similar rate. However, at a certain point, delay occurred to tower A whilst tower B continued to progress as planned. Sometime thereafter work resumed and once again both towers progressed at similar rates though tower B was now ahead of tower A. At a certain point a further delay occurred that affected construction of tower B, with the effect that tower A caught up and passed tower B. Thereafter, work resumed on tower B and both towers progressed to completion at the planned rate of progress. The as-built programme is shown as follows.

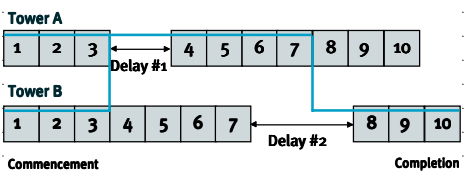
#### As-built programme of two identical towers A and B



When analysed as a whole, and in light of the actual completion, the critical path of activities that determined completion of the works would be that through tower B, since no aspect of tower A affected progress of tower B.

Conversely, if criticality were based on an analysis undertaken as the project progressed, as many contract forms require (ACP, MTRC, KCRC and Swire), then the critical path would be as follows (the blue line indicates the critical path):-

#### Critical path of the project determined whilst work progressed



Initially, the critical path passed through both towers A and B simultaneously since they were identical and were progressed at a similar rate. Once construction of tower A was in delay it became singularly critical, and remained critical until the period of delay on tower B exceeded that on tower A. At this point, there was a "criticality shift" from tower A to tower B and the critical path remained in tower B through until completion.

Clearly, the critical path derived from the networked as-built programme and that determined as the project progressed are different. Which is correct? Well, in terms of assessments for extensions of time the specific wording in the contract is important. Some contracts refer to 'likely' delay to completion whilst other refer to 'actual' delay caused. However, all require the contract administrator to assess and award extensions of time as the work progresses.

### Conclusion

Analysis of project delays through examination of the as-built programme can be very time consuming and requires access to extensive and accurate records. A simply constructed as-built programme often sheds light on the area and extent of delays. However, in-depth analysis and assessments of delays utilising as-built programmes have to be undertaken with care and should always adopt a reasonable position and be undertaken in cognisance of the contract.

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# Damages for Defective Works



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The traditional measure of damages for breach of contract is that they are compensatory in nature and they should put the injured party back in the position that it would have been in had the contract been performed (*Robinson v Harmon (1848)*).

Where there are defective works the courts have generally held this to mean the cost of repair and reinstatement, including in extreme cases the cost of demolition and rebuilding.

Arguments have been put forward however that in some cases a lower measure of damage being the diminution in value of the completed building approach should be adopted, particularly in cases where the cost of repair and reinstatement is out of all proportion to the extent of the defective works. The courts have traditionally been reluctant to accept such arguments and their attitude can be summarized by the judgment in the Canadian case of *Allen v. Pierce (1895)* where the judge stated:

*"It is not a mere matter of the difference between the value of the material supplied and that contracted for, or for the work done and that which ought to have been done, or of the house as it stands and that which ought to have been built under the contract. If these were the standards of damages there would be no point in a man contracting for the best materials. The owner of the building is, therefore, entitled to recover such damages as will put him in a position to have the building he contracted for."*

However, the position of the courts in England appeared to change in the mid 1990s with the case of *Ruxley Electronics v Forsyth (1995)* a case which progressed as far as the House of Lords.

The facts of the case are straightforward. Mr Forsyth entered into a contract for the construction of a swimming pool in his garden. The specification called for the pool at its deepest point to be 7 feet 6 inches in depth. After the pool had been in use for a short while it became clear that the maximum depth was in fact only 6 feet 9 inches. The cost of correcting the problem was estimated to be £21,560. Needless to say the contractor refused to pay up and the matter was referred to Court.

The lower Court took the view that whilst the normal measure of damages for defective work is the reinstatement costs, it does not apply if the cost is out of all proportion to what putting the work right will achieve. In this case it was considered that a swimming pool which is 6 feet 9 inches deep is perfectly suitable for swimming and diving and that there would be little achieved in reconstructing it to the increased depth of 7 feet 6 inches. A sum of £2,500 was therefore awarded for what was termed loss of amenity.

The Court of Appeal however overruled this decision. They considered that Mr Forsyth was entitled to that he had stipulated for in the contract, and further that to allow the contractor to escape by paying only a nominal amount would send out the wrong message to contractors.

The House of Lords did not agree and favoured the original lower Courts approach rather than that of the Court of Appeal. They felt that the cost of demolition and rebuilding was out of all proportion to the loss of amenity caused by the defective work. They were also not convinced that if the money were to be awarded to Mr Forsyth he would spend it on putting the pool right, a point they considered of some importance.

This decision has been criticised by some for opening the door to unscrupulous contractors using inferior materials with relative impunity.

However, it appears from a recent decision in Scotland that the courts may be keen to distinguish the *Ruxley* case and only apply a diminution in value approach to damages for defective works in exceptional circumstances.

The case in question is *McLaren Murdock and Hamilton Ltd v The Abercromby Motor Group Ltd (2002)* where a dispute arose over the Architects choice of a heating system used in the construction of a new motorcar showroom and workshop. An underfloor electric system, which used electricity on a cheap night tariff to heat up the concrete floors to provide warmth for the occupants of the building during the day, was specified.


However, this method of heating was proved to be entirely unsatisfactory for the building concerned because there were large external doors to the workshop, which allowed the mechanics to bring the cars in and out which, when opened, led to severe heat loss. The showroom was also designed with large areas of glass (for display purposes) which again made retention of heat difficult.

The position was so bad that in winter it was uncomfortable for the staff to work in the building and so the owner decided to replace the heating system with one that was gas fired and sought to recover the cost from the Architect.

It was argued on behalf of the Architect that the system had not failed; it was just that at certain times in winter there was insufficient heat for the comfort of those who used the buildings and therefore a replacement of the whole system was totally unnecessary as the problem could have been solved at much less cost by the installation of a supplementary heating system.

The court examined the *Ruxley* decision and considered whether the amount spent on the replacement heating system was out of proportion to the benefit gained. However, in this case they considered that the amount spent on replacement was justified and did not follow the diminution in value approach of *Ruxley*.

It was considered that whilst the works were clearly defective in both the *Ruxley* and the *McLaren* cases, in the former, Mr Forsyth could use the pool satisfactorily without carrying out any remedial works. However, to carry on using the car showroom and workshop without correcting the heating problem would make the use of the premises during some of the winter months very difficult.

Reading these two cases together it seems clear that whilst the courts will accept an argument from a defendant that the injured party has gone over the top and undertaken remedial works well in excess of what is reasonable, the onus will be on the defendant to convince the court that this is the case. It appears that the test will be a strict one and the benefit of the doubt will always be with the injured party who is, as a basic principle, entitled to expect a building of the quality and design that he contracted for. 

# FACILITY CONDITION ASSESSMENT & AUDIT

## - a basic approach



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**A** Facility Condition Assessment & Audit (FCAA) should cover all facilities of an enterprise to help develop an efficient Facility Management (FM) plan of the structural fabric, components, finishes, M & E services, space usage, health, safety, environmental and other related issues, enabling the FM staff to provide methodical repair and preventive maintenance program to mitigate future costs. Clean, safe and aesthetically pleasing environment are thus achieved to fulfil the essentials of FM. A decent FCAA should comprise principally the following:-

### Aims & Objectives

The organisation has to show commitment to undertake a comprehensive condition assessment and audit, incorporating building fabric and services capital renewal analysis to ascertain:

- ▶ The current conditions of each facility.
- ▶ If the building fabric and services meet the functional needs.
- ▶ What future funds and programs are expected to upkeep the anticipated function of each facility.

The collection, documentation and analysis of the audit data should achieve the following aims:

- ▶ Develop a long-range financial planning that protects the value of the organisation's assets.
- ▶ Evaluate the resources needed to maintain the operability, suitability and value of the physical assets given the current status.
- ▶ Examine the extent and severity of the deferred maintenance backlog.
- ▶ Quantify the building replacement costs and facility condition indices, if any. There appears that no such systematic indices are widely and officially adopted in Hong Kong, though some researches are being arranged.
- ▶ Prioritise and schedule deferred maintenance reduction projects.
- ▶ Identify what is anticipated to adapt the selected facilities to meet the present and future plans; the requirements of local regulations, codes, guidelines and the possible implications of changing technology.
- ▶ Innovate an advanced tool e.g. tailored-made CAFM that provides readily accessible facilities information for faster decision making process and assets management to suit individual organisations.

A comprehensively conducted FCAA should assist FM personnel to fulfill the following objectives:

- ▶ Devise methods of correction for each deficient condition.
- ▶ Establish a building component depreciation analysis to forecast renewal investment rates required for maintaining facilities over time. Computerized system will enable systematic and graphical reporting of renewal requirements for individual facility or grouped facilities.
- ▶ Provide the ability for total interactive users to use the software.
- ▶ Identify all deficient conditions in terms of deferred maintenance, capital repair, safety and non-compliance with regulations.
- ▶ Provide digital photographed documentation of individual facility and each deficiency.
- ▶ Computerised system will provide the ability to aggregate correction projects into contract packages or bundles of projects for cost-effective e-procurement.
- ▶ Provide multi-tier financial modeling capabilities and the ability to benchmark facility conditions with similar buildings. Systems should be capable of tracking and modeling for current and future situations, project and analyze costs for deferred maintenance and capital renewal.
- ▶ Install a web-based and relational database management program for the continuous management and maintenance.
- ▶ Provide cost estimates for each project using published industry standards, facilities maintenance and repair cost estimating data to automate annual and ad-hoc updating.
- ▶ Prioritise all deficient conditions, associated correction projects and deficiency classifications.
- ▶ Provide training documentation, upgrade and support for the installed systems, with options for extension.
- ▶ Information and analysis formulated from the assessment process should be transferable to determine staffing and operational needs for current and future projections.

### Extent of Works

#### 1 Preliminary Consultation

The preliminary consultation phase is to confirm a detailed scope of survey, define deficiencies, establish methods, data collection and validation; sources of cost data, schedule, scope and schedule for analysis, recommendations; and requirements for ongoing data maintenance and analysis.

#### 2 Facilities Visit

The visits to facilities will help project participants to become acquainted with locations, access points, contacts, security and other site-specific issues.

#### 3 FCAA and Basic Information

The work will involve inspections and acquisition of fundamental demographic and descriptive information needed to support the survey, analysis and rectification proposals of the organisation's facilities; which will produce an accurate analysis that identifies all visible and discernable components demanding maintenance or other planned actions.

The FCAA will focus principally on the following:

- ▶ Exterior Systems - structure and fabric e.g. roofs, walls, curtain wall, external cladding
- ▶ Interior Systems - components and finishes e.g. suspended false ceiling, partitions, floorings, painting
- ▶ Mechanical, Ventilation and Air Conditioning systems
- ▶ Electrical, HV & LV systems
- ▶ Plumbing & Drainage installations
- ▶ Fire Services
- ▶ Lifts, Escalators
- ▶ Health, Safety, Environmental and related issues
- ▶ Ancillary services e.g. BMS, gas, security, audio and video
- ▶ Space effectiveness
- ▶ Customer's satisfaction
- ▶ Contingency Planning & Disaster Recovery

#### 4 Mapping of Client-Supplied Information

Further to observed facilities deficiency conditions, client-supplied information will be incorporated into the facility database, and subsequently blended with all analytical studies and reports. All supplied data will be examined e.g. prior engineering studies, hazardous materials audits, air and water quality analysis, drainage systems checks (e.g. suspected SARS implications), accessibility studies, energy and waste control etc. For each identified deficiency, correction methodology and costs will be established.

#### 5 Survey Data and Deliverables

Survey data will be standardised with recommended industry standards and improvements. Data should be adequate and specific to permit varying methods of analysis and different levels of summarisation. Deliverables will at least include:

- ▶ A data maintenance plan using delineating methods to include a procedure for sharing information between the FCAA and Computerized Maintenance Management System (CMMS).
- ▶ Digital photographs providing a visual description of each physical deficiency accompanied with relevant findings, indexed to tie in with the master record.

- ▶ A complete turnkey application and database will be resulted, which will support flexible and relatively unconditioned analysis and reporting of FCAA parameters.
- ▶ Computer-based applications adopted for easy access to the data.
- ▶ Plans and sectional drawings organized in a readable format e.g. each floor of the facility with a symbol, linked to the database, locating each deficiency on the CAD drawings and to establish standards for layering and cross referencing.
- ▶ A Final Consolidated Report.

## 6 Deficiency Assessment

The consultant will provide a deficiency assessment that identifies cases where a facility does not meet the desired performances of the end-users. The identified deficiencies will be adopted as both a strategic and tactical planning tool.

## 7 Corrections of Deficient Areas

For each deficient area during the audit, correction tasks will be developed. By applying standardized costing techniques, costs to remove an individual deficiency or an entire category of deficiencies will be formulated. Each correction project should compose a systematic description of the methods, labour and materials anticipated to conduct the work. A detailed, multiple line item and construction estimate will then be established. Multiple correction methodologies will be confirmed stating the range of possible corrective measures and the associated costs. For each correction project, the IT system will enable correction tracking by FM staff when deficiencies are rectified.

## 8 Prioritization & Classification of Audit Data

The database technology will encompass every correction project, where multiple reports and analyses may be generated.

Each correction project identified will be assigned one deficiency category:

- ▶ Regulations compliance regarding life, safety, health.
- ▶ M & E services integrity affecting the entire facility.
- ▶ Functionality about acoustics, lighting, temperature control, space etc.
- ▶ Energy, waste, environmental issues.
- ▶ Hazardous matters e.g. Chlorofluorocarbons, Water Quality, Asbestos Containing Materials, Polychlorinated Biphenyls, Lead-based paints, Indoor Air Quality, etc.
- ▶ Aesthetic, user's perception.
- ▶ Others, if required.

It will then be prioritized:


- ▶ Priority A - Critical currently (immediate action).
- ▶ Priority B - Potentially critical (can be done in a year).
- ▶ Priority C - Necessary, but not yet critical (can be done in years 2 to 4).
- ▶ Priority D - Recommended (can be done in year 5 to 7).
- ▶ Others, if required.

## 9 Benchmarking and Facility Condition Index

The system will be capable of benchmarking facilities, property condition and performance. Facility Condition

Index (FCI) will be formulated considering industry practices, which would enhance the public's awareness of their own workplace and/or built environment conditions. With this FCAA and FCI mechanisms, the organization should have standardized measures to benchmark for other facilities being managed. Further thoughts, items, audit methods etc. could be developed to enrich its content.

## 10 Facility Renewal Measurement

Renewal for the building fabric, components, finishes and services will be considered with the overall state, the expected lifetime, repair and/or the replacement costs at the end of each facility's useful life. Examining the rate of re-investment required to maintain for the expected services is crucial to the long-range planning and annual operating planning of the facilities. The consultant should analyze and model the rates of degradation of the facility and probably report annually or when such facilities become dysfunctional. This approach will also assist in generating multi-level financial modeling based on the deferred maintenance backlog; capital renewal, selected time frame, and projecting funding for strategic planning analysis to render the enterprise to complete in a healthier condition among other business competitors. 

*Adapted, modified and revamped from various sources.*

# Overview on Independent Valuer and Valuer's Independence

*The RICS new rules pose challenges for valuers*



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## Removal of Definition of Independent Valuer in the New Red Book

The new edition of the RICS Appraisal and Valuation Standards, commonly known as the Red Book, which has recently come into force since 1 May 2003, has removed the definition of "independent valuer".

It is noted that under the Glossary of the new Red Book, an Independent Valuer is referred to as "A valuer who meets the specific requirements of independence, prescribed by law or regulations, for particular valuation tasks in certain States."

This represents a drastic change from the old Red Book. Given that many of the valuation instructions are still specifically defined as independent valuations and they are required to be carried out by an independent valuer, the removal of this practice statement no doubt would raise concerns among valuers.

## The Reasons for Change

In this regard, we have consulted with **Mr Duncan Preston**, chairman of the RICS Valuation Faculty, for the reasons of this change and the new practice standard for a valuer to act as an independent valuer.

In his reply to us, Mr Preston advises: "The valuer must now confirm in the terms of engagement the criteria which are required for independence and that the valuer can comply. The change has come about because of the confusion with clients between 'Independent' as defined by RICS and 'independence' as sought by the client."

"It was also found that a number of organisations have their own definition of Independent Valuer and there was again an inconsistency arising. **The key is that the valuer must have independence, integrity and objectivity, and it is the client who will require an Independent Valuer.**"

In summary, he provides three major reasons for this change:

- 1 To adopt the principles of the International Valuation Standards (IVS).
- 2 To avoid ambiguities and misunderstandings by clients and users.
- 3 To amplify the requirement that all valuers are required to have independence, integrity and objectivity in the performance of their task,

whichever role (independent valuer, internal valuer or external valuer) they fulfill.

The IVS does not define an independent valuer. It says: "With some clients, and in certain States, additional restraints may be applied, by regulation or law, to the term Independent Valuer under specific circumstances. It is not the purpose of this Code (the Code of Conduct in IVS) to define different degrees of independence beyond the standard of independence already required under this Code."

On the other hand the RICS has issued some guidelines which strengthen the requirements on valuer's independence in the new Red Book (see box)

## Requirements of Independent Valuers Among Local Users Do Vary

While the UK valuers recognize that there is already confusion among users for independent valuations, our recent research study on the provisions in various local regulatory frameworks which stipulate a requirement for independent valuation echoes a similar view:-

### A The Hong Kong Society of Accountants - Statement of Standard Accounting Practice (SSAP) 13 Accounting for Investment Property

According to Code 8 of the SSAP 13, investment properties should be included in the balance sheet at their open market value, based on a period end valuation carried out: (a) annually by persons holding a recognized professional qualification in valuing properties and have recent post-qualification experience in valuing properties in the location and in the category of properties concerned; and (b) at least every three years by an **external valuer** with similar qualifications to those in (a) above.

The SSAP does not provide a full definition on external valuer. But we understand the HKSA is currently reviewing the SSAP with a mind to adopt the International Accounting Standard (IAS) with modifications to suit the local context.

If the IAS were adopted in future, the concept of "independent valuer" in IVS would likely be introduced to the SSAP.

### B The Stock Exchange of Hong Kong - Listing Rules

Under Code 5.08 of the Listing Rules, all valuations must be carried out by an **independent qualified valuer** who is not a director or a subsidiary of the issuer's holding company or an associated company. (Please note this is an abridged version, readers please refer to the Listing Rules for details)

We understand that the Stock Exchange of Hong Kong is currently teaming up with the Hong Kong Securities and Futures Commission in reviewing the

requirement of independent valuers. The HKIS has been consulted in the process. In future, there should be a clearer set of rules on the valuer's independence.

### C The Hong Kong Securities and Futures Commission - Draft Code on REITs

Under Chapter 6 of the Draft Code on REITs, an **independent valuer** must be acceptable to the Commission and independent of the scheme, trustee and management company. The valuer must retire after serving the scheme for two consecutive years. In addition, the Code also provides further safeguards on the valuer's independence in the scheme's transaction valuation, for example, the valuer or the valuer's firm must not act as an agent in the property transaction; has not provided valuation on the subject property for the scheme's counter-party in the past two years.

During the consultation stage, which ended in April, many industry participants including the HKIS had expressed concerns on the various requirements of valuers stipulated in the Draft Code. It is yet to see how the final Code would evolve.

## Implications

In the light of the existing different requirements among local users for independent valuers as well as the recent move taken up by RICS in the new Red Book, it is high time for the definition of independent valuer, provided in the HKIS Guidance Notes on Valuation of Property Assets, to be reviewed.

"The financial debacles of Enron, Worldcom and the latest one with Freddie Mac have heightened the public's awareness on the conduct of professionals. If there is one lesson we can draw from these for valuers, is that we need to move fast to embrace world-class standards and adopt the best practices," says **C K Lau**, Head of Valuation Advisory Services, Jones Lang LaSalle, in a recent in-house Red Book briefing session.

### Acknowledgement:

Mr Duncan Preston, chairman of RICS Valuation Faculty and National Director of Valuation, Jones Lang LaSalle (UK).

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**Salient Requirements for Valuer's Independence under the Red Book:**

- ▶ Where there is a potential conflict of interest, the valuer must disclose it to the client and seek his approval. If the potential conflict cannot be solved in a satisfactory way, the valuer must decline the instruction.

Examples where a threat to valuer's independence or objectivity may arise:-

- a. Acting for the buyer and seller in the same transaction;
  - b. Acting for two or more parties competing for an opportunity;
  - c. Valuing for a lender where advice is also being provided to the borrower;
  - d. Valuing a property previously valued for another client;
  - e. Undertaking a valuation for third party consumption (e.g. valuation for financial statement, listing, merger and acquisition) where the member's firm has other fee-earning relationships with the client
- ▶ The valuer must keep a record of discussions with the client, which lead to changes in valuation during the draft reporting stage. If requested, the record must be made available to the auditor and other parties (e.g. relevant regulatory bodies) with material interest in the valuation.
  - ▶ In the UK, the practice standard for valuer's independence is more stringent, especially for valuation for third party use. The valuer must disclose the fee-earning relationship with the instructing party in the report, refrain from valuation where he has given transaction advice in the past twelve months and also maintain an internal policy for rotating the valuation personnel.

# Is Fractional Interest of a Real Property the same as the Proportion of the Entire Interest?

## *Part I - Control Premium and Minority Interest Discount*



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**M**athematicians firmly believe that the sum of the parts is always equal to the whole. When a fractional interest of a real property is valued, some may assess the total value of the entire interest and then apportion the share to produce its fractional value. However, the concept of mathematicians may not always be applicable to valuation. The question of whether the summation of every fractional value is equal to the value of entire interest will be the main theme of this article, examining the differences in valuing entire and fractional interests.

Every asset cannot exist without ownership. The degree of the ownership is often an important element in the preparation of valuation. In valuing a fractional interest of a real property, after determining the value of the entire interest and calculating its proportionate value, the next thing, that may be commonly overlooked, is to consider any required premiums (which increase the estimated value) or discounts (which decrease the estimated values) to the proportionate value in order to reflect the different characteristics between an entire and a fractional interest.

While many types of premium and discount may be encountered in performing fractional interest valuation, the most common ones are:

- a) Control premium/minority interest discount; and
- b) Discount for lack of marketability

A controlling interest in an asset is usually worth more than a minority interest. In addition, an investment that is freely traded and can be easily sold is worth more than an investment that is not marketable. The control premium/minority interest discount will be discussed in Part I and the discount for lack of marketability will be investigated in Part II.

### Definition

Many people may believe that a fractional interest of an asset is worth its proportionate share of the entire value. These people feel that if one holds a 30% interest of a residential flat, with a total value of \$1,000,000, then his interest is worth \$300,000. Nevertheless, they may ignore that some characteristics have been changed to a fractional interest. A controlling shareholder should have more value on top of this \$300,000 because he can enjoy more benefit than that which are not enjoyed by the minority interest. Therefore, minority interests are usually worth less than a proportionate share of the value of total assets while controlling interests are worth more than its proportionate share.

It is important to determine in the course of our engagement that the subject fractional interest is a minority or controlling interest. Once it is known, a control premium or minority interest discount on the proportionate value of the subject property is essential to apply. According to the Business Valuation Standard (2003 edition) of the American Society of Appraisers, a minority interest discount is the exact opposite of a control premium and is defined as follows:

**Minority interest discount** - The reduction, from the pro rata share of the value of the entire business, to reflect the absence of the power of control.

**Control premium** - The additional value inherent in the control interest, as contrast to a minority interest, that reflects its power of control.

### Difference between a Controlling and a Minority Interest

It is a common perception that a controlling interest is the one who owns more than 50% of the total share while a minority interest is the one who owns less than 50%. This is called "simple majority". It is simple and is easily understood when two persons possess one asset only.

From the valuation point of view, determination of whether a controlling interest or a minority interest is not from how many percentage of shares are owned, but whether it really enjoys some valuable right which a minority interest do not have. Of course, in some cases such benefit is given to the one who possess over 50%. However, there are still many factors putting on

various restrictions on the controlling benefit. The control premium and minority interest discount spread over a spectrum in accordance with different situations. Elements that may influence the degree of control that can be exercised include contractual restrictions, effects of regulations or laws and effects of distribution of ownership.

### Contractual Restriction

Contractual restriction means any legal binding contracts and documents among the co-owners of the property, which govern the rights among co-owners. It may give some benefit or restriction on various co-owners. For example, if two owners, **A** & **B** owns a shop with a monthly rental income of \$10,000, and **A** has 60% share while **B** has 40% share, and the assignment stipulates that anyone who has over 50% share can enjoy the privilege of selecting tenant and negotiating rents, then absolutely **A** has control premium over **B** though their rental incomes are allocated according to their shares. If the assignment specifies that the watershed should be over 70%, then none of them, **A** and **B**, has control premium over the other side. They need to compromise and no one could dominate in the decision making.

### Effects of regulations or laws

The government policy and statutory ordinances often influence the ability of owners to enjoy control right of the fractional interest. Generally, any owner under tenancy in common can freely sell and assign his share without necessarily obtaining approval from others. However, in some cases regarding substantial alternation of the characteristics of the real property, such as lease modification or land exchange, consent from all owners are essential, no matter whether he owns 1% or 99%. The above requirement could exert negative impact on the control interest.

Under the Land (Compulsory Sale for Redevelopment) Ordinance, the right of majority interest is protected by the Ordinance. If one owns not less than 90% of the undivided shares, he can apply to the Lands Tribunal for compulsory sale for redevelopment. A person who owns 90% has a control premium over a person who owns 75%, because the former enjoys the benefit of deciding the redevelopment of whole property.

## Effects of Distribution of Ownership

Under a simple majority system, if one shareholder owns 49% and another owns 51%, the 49% shareholder has little or no control. However, if two shareholders own 49% each and a third owns 2%, the 49% ones may be on a par with each other depending on who owns the other 2%. The 2% shareholder may be able to command a premium over the normal minority interest value for that particular share because of its swing vote power.

If each of three shareholders or partners owns a one-third interest, no one has absolute control. Each of the equal individual interest is normally worth less than a pro rata portion of the entire interest. Thus, the sum of the values of the individual interests usually is less than what the total enterprise could be sold for to a single buyer. However, the percentage discount from pro rata value for each equal interest normally would be smaller than that for a minority interest with no control.

## Application of Premium Control / Minority Interest Discount

No discount or premium can be applied without a base. Discount and premium are relative words which require a standard of line to be defined. When valuing a minority interest, what could be done is to (i) find some comparables of controlling interest and apply a minority interest discount; or (ii) find some comparables of minority discount without applying any minority interest discount. In the situation when a controlling interest is to be valued, the methodology is reversed. In Hong Kong where market data of minority interest transaction is difficult to be obtained, method (i) is the main way to the valuation of minority interests. But without a comprehensive study of quantifying control premium/minority interest discount, heavy weighting is expected to be put on the shoulder of professional judgment.

Part II discusses another important issue in valuing fractional interests - "Discount for Lack of Marketability". <sup>138</sup>

# Kvernhuset Secondary School, Fredrikstad, Norway

*- A Different School... Contributing to the Knowledge of Planning and Building Environmental Friendly Schools*



**Kenneth CHAN Jor Kin**

BSc(Leics.), FRICS, FHKIS, FIBC, FBEEng,  
MCI(Arb., F.PFM, CFM, CFMJ), RPS(BS), AP(S)

## Introduction

The planning and building process for Kvernhuset secondary school has involved not only skilled workers, craftsmen, engineers and architects, but also the pupils of today and tomorrow, teachers, parents and politicians. Through influence everyone has been able to contribute to the shaping of this school.

The gross area of the school is 6,488 square metres. The sports hall is 1,847 square metres. The number of pupils will be 450-500.



The ground floor houses all the common areas including office, teachers' common room, library, canteen, etc. The first floor houses all the classrooms and special rooms.

## The Site

The school is located in a forest area just north of the city of Fredrikstad. The site is extremely beautiful and varies between open pine forests on rocky ground to dense spruce forest amidst which runs a little stream. The forest is a protective screen against wind, dust and noise and it also filters the direct sunlight.

## Objectives of the Project as an R&D Exercise

The overall aim is to obtain knowledge about environmental friendly school buildings and to disseminate the knowledge to school planners.

The idea behind this project was to build a future-oriented school based on Fredrikstad's commitment as one of the environmental cities in Norway. It is part of the Municipality's programme

for Local Agenda 21. The objectives of the R&D project are:

- ▶ According to standard practice the school building should be area efficient and adaptable to various working methods.
- ▶ The school building and yard should be used as teaching tools to support the Nature and Environmental studies.
- ▶ The school building should have low purchased energy consumption in respect to space heating, ventilation and artificial lighting. Renewable energy should be utilized when possible.
- ▶ According to the Norwegian assessment method 'EcoProfile' the school building and yard should obtain the best quality class for each of the three areas: Environment, Resources and Indoor Climate.

## Area Adaptability

One objective, when designing base areas, was to create flexible buildings adaptable to different functions.

The school should have the possibility to experiment with different pedagogical settings. Rooms and furniture should be adaptable to various working methods. The wings with the pupils' base areas consist of three zones: area for classes, 'spine' and common area.

Changes may easily be accomplished and the pupils and teachers themselves can arrange and rearrange the layout of their area.



Flexible space



Daylight is everywhere

## School Building and Yard as Teaching Tools

Area adaptability, energy saving strategies and ecological cycles are the measures to reduce consumption of resources.

The objective is to manifest measures that contribute to sustainability in such a way that the measures have a demonstration and teaching effect. With demonstration in mind, or thinking of the school building and yard as teaching tools, three levels are defined:

**The first level** is to demonstrate solutions chosen for the whole building complex.

Special emphasis is given to:

- ▶ Exploitation of daylight
- ▶ Exploitation of natural driving forces for ventilation
- ▶ Exploitation of geothermal heat (heat pump)
- ▶ Natural cleaning of waste water, both grey and black water

**The second level** deals with measures that are too expensive or, for some other reason, not suitable as a solution for the whole building complex.

The pupils' base areas are divided into three sections with each having different installations for demonstration:

Section **YELLOW** with focus on solar energy. Active and passive use of solar energy. Solar collectors and solar cells. Monitoring of energy use.

Section **GREEN** with focus on growth and recycling of materials. Vegetables and plants inside and outside. Ecological cycles.

Section **BLUE** with focus on water. Collecting water from the roof. Water saving armatures in toilets and washbasins.



Solar panels as teaching tool



The third level deals with devices that facilitate ecology studies (terrarium, aquarium apparatus), and art decorations to highlight ecological aspects.

### Situation and Materials

The buildings are situated along the sides of two hills, facing each other and leaving as much as possible of the site free of impact. The whole project is put together of simple rectangular volumes. This means a great extent of element-production that saves costs and time.

The ground floors are 'cut' or 'carved' into the rock, using the cut as an interior wall in the hall, giving a 'cave' like feeling. The hills 'reoccurs' as buildings clad with granite rubble and timber from the site.

Exterior walls are a combination between isolated paneled walls (wood from the site) translucent isoflex and glass panels.



Local and environmental friendly materials employed for the external facade

### Landscape

The existing landscape was kept in its original state as far as possible:

- ▶ Preserve the nature through the construction process
- ▶ Use materials from the site
- ▶ Treat the surfaces close to the entrances
- ▶ Let nature give shape to artificial landscape (play areas, parking areas, walkways, etc.) instead of the opposite
- ▶ Let nature reclaim the site through time (vegetation on ground floor roofs, rubble heaps and granite rubble walls)



The School setting quietly in the tranquil natural environment

### Special Technical Solutions

Technical solutions integrated in the design contributes to energy saving and a better indoor climate. The most important renewable resources present on the site are daylight, fresh air and possible heat and cooling source from the ground.

The school has a thermal natural ventilation system based on an underground duct-system that minimizes the need of air filters, heating and cooling. As much as possible of the energy for heating and cooling, will be delivered by a heat pump (holes drilled vertically into the rock).

Daylight is let into the building through skylights and translucent facades to increase energy efficiency and give better working conditions.




Skylight for natural lighting

A wastewater cleaning facility in the lower end of the site is taking care of all the sewage.

The interior of the school will be filled with plants as a means to clean moisten the air.



Aerial view of the school campus

*(Author's note: This was a building visited by the author as part of the programme of an eco-tour after the Sustainable Building 2002 International Conference convened in September 2002 in Norway. This article is compiled based upon information provided by the school authority, architect, engineer, etc.)* 

# Is being *Green* a luxury for Hong Kong?

- Written for the Occasion of the Inauguration of the Professional Green Building Council



The arrival of SARS has shaken all aspects of our society. It has not only stricken people to illness. It took lives. It revealed the deficiencies in the management of our built environment. It questioned the sustainability of our developments. It has awakened us to rethink the way we've been living. It mockingly declared the vulnerability of us living in this high-density high-rise environment. It added substance to our consideration of designing for green and sustainable buildings.

The grand economic wheel had been driving the mass of construction of our buildings to merely filling the immediate need of providing shelters. We have been pursuing various technological advancements in improving the comfort of living but there were little consideration given to the environment and their impact on the environment. There was a total absence of the quest for sustainability for future generations.

Our planning guide was prescriptive, consisting of figures on space requirements and facilities to be provided but short of any indication on the environmental performance standards to be achieved. Could sustainability be achieved just by observing these quantitative standards in the absence of strategic quality objectives?

Many developers have long been over emphasizing the view of a portion of the residential units in their sales programme or even in the conceptual design development of the residential estates. Our designers are still relying on the outdated regulatory provisions in

lighting and ventilation when designing our residential units. The reluctance in adopting the new performance criteria was a point in view. The century old regulations are still shaping our developments. How much longer can we tolerate as they are not doing any good in achieving sustainability? Was life cycle costing ever considered in the inception of developments? This is a sustainability issue!

Our current construction methods were appalling in green terms. We were the last place in the developed countries that continued with the use of a lot of conventional in-situ method of concreting. Pre-casting of building components in our construction activities was only just beginning. There were still a lot of wastes generated from our construction operations. Is the construction industry geared up to make its contribution in minimizing and eliminating construction wastes?

Our building stock was aging and repair and maintenance were grossly neglected. One of the reasons was that access for maintenance was not readily available leading to general dilapidation. We have to spend a lot just on temporary works to get repairs done. Again, this is a sustainability issue.

We were still demolishing old buildings that were structurally sound albeit some facilities were outdated or lacking. Should there be a comprehensive policy in rehabilitation as against redevelopment and demolition altogether? The mandate for the Urban Renewal Authority to actively seek ways and means to implement revitalization and rehabilitation should be further enhanced and supported.

Our generation had demolished nearly all the buildings that were worth keeping. Are we building quality sustainable buildings that are worth preserving? A holistic education on our environment had not been put in place in the previous generations including this of ours. We not only need to create buildings worth keeping,

we must leave with our next generation the desire to preserve good things that are passed onto them from the preceding generations. This is something that must be pursued vigorously individually and collectively by bringing together the academia, researchers, professionals, developers, product manufacturers and the authority. It is my sincere belief that the formation of the Professional Green Building Council will fill in the gap and act as a magnet to draw the forces together to set the stage for rolling out the essentials for sustainability.

## Professional Green Building Council

After almost two years of preparation, the Honorary Advisor, Mr Michael SUEN Ming Yeung, Secretary for Housing, Planning and Lands on 10 June 2003 at the Hotel Inter-Continental, officially inaugurated the Professional Green Building Council (PGBC). The four Hong Kong institutions of architects, engineers, landscape architects and surveyors jointly founded the Council. This marks the exciting beginning for the professionals to officially come together to research and educate fellow professionals and the general public in creating a green and sustainable built environment. The Council will work closely with other stakeholders in identifying and implementing a relevant scheme for the environmental assessment of our built environment.

Apart from Mr Suen's acceptance of the invitation to be the Honorary Advisor, it was particularly encouraging to have ten government officials including permanent secretaries and directors of departments agreeing to be advisors of the Council. You can visit the Council's web site <http://www.hkpgbc.org> for more details.

The objectives of the Council is three-fold:

- ▶ to conduct collaborative research and publish research results on local and global developments of green buildings;

- ▶ to organise researches seminars and training courses in green building design and technology; and
- ▶ to advise the government on the formulation, setting up and monitoring of a local green building labeling scheme.

CHAN Hak, Tony Tse and I now represent the Hong Kong Institute of Surveyors on the Board of Directors and Executive Council of PGBC. I have also been elected Vice-Chairman of the Council and Chairman of the Board of Public Affairs. Our participation and involvement is fully fledged. I look forward to the wider participation of surveyors in this venture. Let us do our part in contributing in whatever ways that surveyors could do to leave a greener and more sustainable built environment to the next generation. ☺



## ▶ Surveyors Fellowship – Home Coming!

Monthly Fellowship meetings are held in the Library of the HKIS office every last Tuesday of the month at 7.30 pm. For further details please contact [lam\\_horace@hotmail.com](mailto:lam_horace@hotmail.com)

# How to Start Your First Piece?



Jim YIP  
Hon Editor

Many people would agree that the most effective way to improve the writing skill is 3Ps - practice, practice, and practice. And practice makes perfect.

As this year's Hon. Editor, no doubt you would expect me to say that the best writing practice is in fact contributing articles to Surveyors Times.

Having your article published in your trade journal not only provides you with a fulfillment but also a motivation in writing.

It is true. I for one have been through this experience.

How do you start your first piece? By observation and research. I recommend the following steps for those who have no idea how to start his/her first piece:

- 1 Write a diary of your daily work
- 2 Note down any interesting observations e.g. client instruction; problems not encountered before etc.
- 3 Record the advice given by your seniors

- 4 Record any Ordinance or practice notes you have made reference to
- 5 Research any precedent cases
- 6 Record the procedure and methods you have taken

At the end of the day you will have an interesting project and a specific topic that you can write about its problems and its solutions.

That is it, writing your first piece in Surveyors Times is as simple as that! If you have no time for editing, send your first draft to the Editorial Board, let us give you comments and complete the task.

While you are writing, don't exert too much undue pressure on yourself. It is you who decides what and to what extent you want to cover in the article and not others. We only want something not exceeding 1,000 words.

Next month in this column we will have Kenny Chan, our rising star (you would agree if you have read his two articles in this month's Surveyors Times), to share his writing experience. Kenny is a land surveying graduate in the Lands Department.

**This column is open to all members who wish to share their writing experience with fellow members. Send your article to [editor@his.org.hk](mailto:editor@his.org.hk)**

THE THINKING PROCESS OF MY FIRST TWO ARTICLES		
	<i>SCMP Property Post February 1998</i>	<i>The HKIS Newsletter March 1998</i>
<b>1 Any issues that touch your heart most</b>	Property price meltdown and small players' competitiveness.	Housing policy.
<b>2 What is your observation</b>	Government 's announcement of curtailing land sales rejuvenated the pre-sale market, but activities dominated by big developers and smaller developers remained on the sideline.	A common belief that the property boom in 1997 was triggered by shortage of new supply was wrong.
<b>3 Any evidence to support your claim</b>	Developer of Symphony Bay re-launched its sale with new sale price 30% lower; refused to compensate buyers in the first batch.	Compared with 1992, new units in 1996 dropped by 33%, but completed GFA increased by 8% and size per unit rose by 60%.
<b>4 Your argument</b>	Unlike the big developers, small developers have much less number of stock to sell for one single development and can have greater pricing flexibility which is their competitive advantage.	New supply actually didn't drop; flat size getting bigger, thus new units dropped.
<b>5 What will be the issue you want to raise</b>	Innovative and non-conventional pricing strategy is a wild card that small players can play.	Market not paying enough attention to demand side; trade-up demand was the key driver for the property boom by looking at the liquidity ratio of the outstanding mortgage loans in 1997.
<b>6 Any insights you can draw from your study</b>	A buy-back option to pre-sale buyers to guarantee price shortfall; a trade-up option to acquire new buyer's old flat to stimulate more trade-up demand.	After the Asia financial crisis, market fundamentals changed, housing demand shifted from existing owners to first time buyers, developers would respond by modifying development plans and building smaller units, as a result, new units would increase in the future.
<b>7 Theme</b>	Small developers need flexible marketing strategies to compete.	Market supply bigger than what we think; new ways to analyse the market.

# Leadership

## The Definitive American Leader's Personal Guide to His Principles of Leadership

Written by Rudolph W Giuliani

ISBN 0-316-72455-6



This month's book review is written by the Hon Editor Jim Yip as Cliff Tse is on leave.

The SARS attack has provoked a citywide rethink on our public hygiene standard, urban planning, building code, urban degradation and crisis management plan. A good crisis management plan cannot be complete without strong leadership.

This book, written by former New York city mayor Rudolph Giuliani, provides a gripping account of Giuliani's immediate reaction to the September 11 attacks, including a narrow escape from the original crisis command headquarters, and closes with the efforts to address the aftermath during his remaining four months in office. But, he argues, he did not suddenly become a great leader on September 11, and "had been doing [my] best to take on challenges throughout my whole career." The bulk of the book draws on his experiences as a corporate lawyer and U.S. attorney and then as mayor.

Leadership, Giuliani writes, works both ways: it is a privilege, but it carries responsibilities - from imposing a structure suitable to an organisation's purpose, to forming a team of people who bring out the best in each other, to take the right, unexpected risks. A leader must develop strong beliefs, articulate and act on those beliefs, and be held accountable for the results.

As mayor of New York City, he displayed the hands-on management that marked his administration, including his willingness to respond swiftly and in person to crises, to prove that he could be relied on when the city needed him most.

This book couldn't come at a better time for our city's leaders when they will have some soul-searching to do in reviewing the way they have handled the crisis in the past few months.

In fact, the insights on leadership skills that Giuliani has used so effectively in combating both personal and the city's crises are not only useful to government officials, but to every manager and professional in any sized enterprise.

### Some of the Giuliani 's principles on leadership:

#### *Prepare relentlessly*

Leaders must possess brilliance, extraordinary vision, fate and even luck. Those help but no one, no matter how gifted, can perform without careful preparation, thoughtful experiment and determination.

#### *Don't leave it to the experts*

Any good leader must develop a substantive base. No matter how talented your advisors and deputies, you have to attack challenges with as much of your own knowledge as possible.

#### *With an inquiring mind*

More often than not a bright person who hasn't become shackled by bad habits or a "That's the way it's always done" philosophy can be a catalyst for change.

#### *When I delegate, I delegate*

I hired good people instead of yesman. A leader wants someone who doesn't just kowtow but can step up to the plate.

#### *Encourage staff to think outside the box*

I frequently asked people on my staff to handle things beyond the parameters of their job description. To be sure, some employees are unnerved by the prospect of challenges in unfamiliar areas, but because people who worked for me knew that "it is not my job" was never the right answer, a surprising number of these experiments yielded unconventional solutions invisible to staff much more familiar with the terrain.

#### *Defy expectation*

The best way for a leader to set an independent tone is to establish that every decision, including

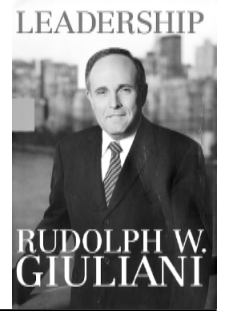
those made by people who act on the leader's behalf, must be made for the benefit of the enterprise. As mayor, I told this to my employees over and over. It doesn't matter if you say no to someone who's my closest friend or biggest campaign contributor. I'll support you because I want you to make decisions on the merits.

#### *Set an example*

There is no more powerful motivation for others than a leader who sets an example. Teachers, philosophy, inspirational speeches are all valuable, but setting an example is the most valuable of all. The most important element of setting an example isn't attitude or diligence, but performing some of the tasks that you ask others to execute. If you can do what the people working for you do as well as the best of them, your ability to lead is enhanced tremendously.

#### *Optimism of leadership*

It is up to a leader to instill confidence, to believe in his judgement and in his people even when they no longer believe in themselves. Sometimes, the optimism of a leader is grounded in something only he knows - the situation isn't as dire as people think for reasons that will eventually become clear. But sometimes the leader has to be optimistic simply because if he isn't nobody else will be. And you have at least got to try to fight back, no matter how daunting the odds. ☞



# Stacey Lau, Quantity Surveyor



*Stacey Lau, Associate Director of Concord Construction Consultancy Group Ltd is a high flier in quantity surveying. She tells us her even more ambitious plan in career.*

## 1 Where did you obtain your degree in surveying and why did you choose this profession?

I graduated from the University of Hong Kong. The course was a general surveying course leading to opportunities in general practice surveying, quantity surveying and building surveying. My choice was for the quantity surveying discipline. I passed the Assessment of Professional Competence to become a member of the Hong Kong Institute of Surveyors and a chartered surveyor. I became interested in the alternative dispute resolution field and took the arbitration and dispute resolution course at the City University of Hong Kong. I now have a master degree in arbitration and dispute resolution.

The construction industry is a dynamic industry and certainly was a booming industry in Hong Kong. If you are in the construction industry, you have the opportunity to deal with a broad spectrum of people including directors of developers, construction workers, professionals like architects, engineers, construction managers, lawyers, interior designers, etc. This makes the job very interesting. And also, during the academic training, the field of study is broad too. We studied management, economics, law, construction technologies and we even had lectures on how the stock market worked. We also had the opportunity to do research study when we prepared our dissertations. I think the variety of exposure is larger than in many other disciplines.

## 2 What was the most memorable event in your career?

The most memorable event happened when I joined the team of quantity surveyors and planners that assisted the Hong Kong Airport Authority to settle the HK\$3.2 billion claim on the Passenger Terminal Building at the Hong Kong International Airport. It was a challenging task as the Airport Authority and the Contractor had reached a stalemate in the claim negotiation process, and before our team arrived the Contractor had resorted to arbitration. We were asked by the Airport Authority to review the Contractor's claims and to negotiate with the Contractor to arrive at a realistic platform on which the final negotiations by the Airport Authority's Director of Special Duties were based. We did a critical review of all the claims and a planning exercise to prepare a delay impact analysis in 12 months. After that, we met the contractor regularly and negotiated with them for another 6 months. Towards the end of the 18-month assignment, there was a presentation in the Hong Kong International Arbitration Centre which lasted for about

two weeks, whereby the high-level executives, lawyers, project team members and consultants of both parties gathered together. Each of the two parties did presentations so that everyone would have a clear understanding of each other's positions and of the result of our 6-month negotiation. I remember there were around twenty representatives from each side, making a total of around forty people, and I was the only woman in the presentation.

We were given high commendations from the Board of Directors, the Director of Special Duties and the Contracts and Controls Divisional Manager of the Airport Authority in recognition of our achievements on this assignment. I thoroughly enjoyed my time on this assignment.

## 3 Why did you go into construction dispute resolution and how different is your present job from traditional quantity surveying?

After the experience in the airport assignment, I discovered that dispute resolution was an interesting area I liked to pursue. I am now working in a small construction consultancy company. It is still a very new company and has only been established for less than 18 months. Since I joined the company when it was first established, I had been involved in a lot of non-surveying tasks, such as setting up the company, setting up the computer system, business development and even designing the company brochure.

What I am doing now is actually part of a quantity surveyor's duties, avoiding and resolving disputes. Apart from giving advice on avoiding disputes and resolving them at an early stage, I am also involved in construction arbitration and litigation, in providing quantum advice for the preparation of pleadings and submissions. Our company is about to get involved in development management of construction projects including distressed buildings in the South East Asian area.

## 4 How do you see the future of surveying?

I think the future is basically bright. People in our profession have worked very hard to build up the respect and recognition of our profession from the society of Hong Kong and we must treasure it. We have done reasonably well in expanding our range of services to keep up with the changing needs of the society and we have established the quantity surveying profession in Mainland China. As long as we equip ourselves adequately, we need not to worry about the recession we are now facing. After all, people only realized they were in a booming economy after they got out of it.

## 5 Do you have any particular interests?

Yes, I do have a lot of interests and I think sports are particularly important to me. My favorite is water sports.

# Property Rebounds But Oversupply Continues



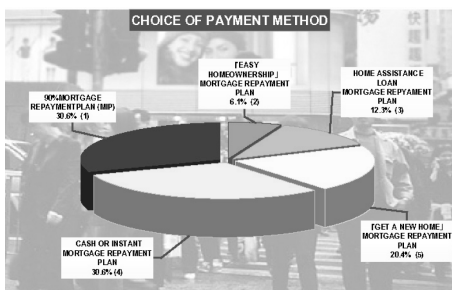
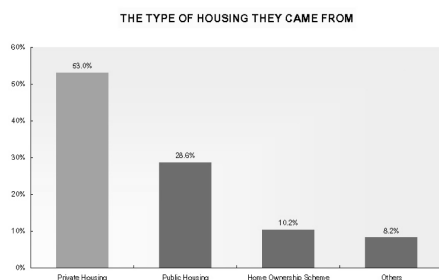
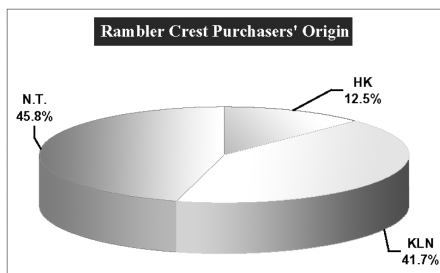
**Ronald Y F CHEUNG**

BSc(Hons), MHKIS, MRICS, RPS(GP)  
Director of Midland Surveyors Limited

The pent-up demand released after the subsidence of SARS was apparent after the launch of Rambler Crest in mid May.

The first large-scale development offered for sale since SARS and at an average price of HK\$1,688 p.s.f., Rambler Crest captured high market attention. About 600 flats were sold during the first weekend of launch, on 7-8 June.

Being a successful sale, it merits a more detailed analysis. Various aspects of purchasers' profile and choice of payment methods are shown in the following charts:



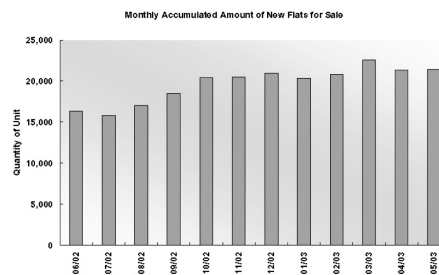
## Notes:

- 4% reduction on List Price, Mortgage Insurance Plan
- 1% reduction on List Price
- 4% reduction on List Price
- 4% reduction on List Price
- No reduction on List Price

In addition, a number of developments were re-launched after mid May. Sales was satisfactory, as evidenced by the following table:

SUMMARY of Other Developments Offered for Sale		
Name of Developments	Location	No. of units sold from 12/5/03 to 8/6/03
Hampton Place	Tai Kok Tsui	46
Parak Central	Tseung Kwan O	93
Tseung Kwan O Plaza	Tseung Kwan O	53
Banyan Garden	Cheung Sha Wan	29
Libertef	Cheung Sha Wan	13
Seaview Crescent	Tung Chung	94
Island Resort	Siu Sai Wan	41
Sorrento	Kowloon Station	44
Bel Air Phase	Cyberport	12
One Beacon Hill	Kowloon Tong Station	27

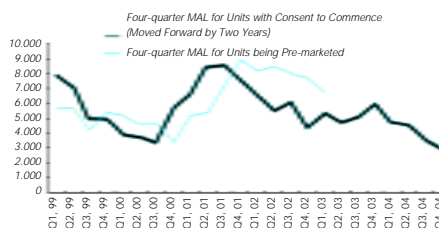
As at the end of May, there were, however, still 21,406 first hand flats, which remained, unsold, as shown in the following chart:



The above accumulation probably would not be easily absorbed by the market as considerable supply still looms. Upcoming supply, among others, includes the following larger ones:

Rambler Crest (Tsing Yi)	1,585 flats
Yoho Town (Yuen Long)	2,224 flats
Caribbean Coast Phase II (Tung Chung)	1,240 flats
The Harbourside (Kowloon Station Phase IV)	1,122 flats

In view of the continuing massive supply, it is expected that unsold units will remain at about 20,000 units for some time. Supply of flats will only drop in 2005, as shown in the following chart:



Source of information in the above charts and table: Midland Realty Research Department.

# Land Power

An interview with Mr Ted Chan, Managing Director of Ted Chan & Associates Limited



Written by

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**George CY LEUNG**

MHKIS

*Being one of the largest land surveying firms in Hong Kong, how can you keep your business running and how is the market at this stage? Are the competitions serious?*

Oh yes! That's true. For example, in the land boundary survey, the number of jobs was only about 300 to 400 per year before 1996. The number reached a peak at more than 800 in 1997 and the number of land subdivision was at a level of 500 this year. The number of registered deed polls following these subdivisions was reduced to around 200 per year between 1997 and 1999. However, the number of subdivisions continued to fall after 1999 and there was only about 50 subdivisions in 2002. We also found that the number of subdivisions and those being registered were about the same. This situation reflects that people will now subdivide their land only when they are really intending to redevelop.

Against the backdrop of economic sluggishness in recent years and aggravated by the attack of SARS, land surveyors are facing the same situation as other industries in Hong Kong. The cost of running a business remains the same, but the survey fees are cut by about 60% compared to 1998. The competition in the market is really terrible at this moment. This is possibly because more and more land surveying firms are established and there are malignant competitions between the firms. However, a minimum level of quality must be achieved in order to fulfill the reputations and the goodwill of the company. From my point of view, I truly believe that the quality of the products is much more important than the profit.

*How can you upkeep the quality of your services?*

Assuming that the level of expertise of each firm is the same, then, quality of services is what we shall be striving for. Having this belief, our firm was the first land surveying firm in Hong Kong to achieve ISO 9000 accreditation. The implementation of a quality control system can really provide our clients with confidence. In practical aspects, we are providing all our knowledge with integrity when discharging our duties. By these, we trust that our service quality and reputation can be kept soundly.

In my opinion, the overall service quality of the industry is important as well. However, as I know, some of our colleagues are furnishing "certification service". Plans and survey data are endorsed with their qualifications but without direct supervision or even knowledge of what have been done. This malpractice has a deep impact on the whole industry and the Institute must take appropriate actions to address this issue.

*Tell us some interesting projects you have been involved with in recent years?*

We did an interesting project for KCRC last year. The tasks included the conditional survey of the water courses along the alignment of KCRC East Rail Lok Ma Chau Extension as well as the Orthophoto Mapping of the area. For the purpose of orthophoto mapping, a total number of 36 photo control points were established by deploying GPS. Finally, the orthophoto maps were produced in the scale of 1:2000.

Another large and long term project is the term consultancy for the land surveying jobs including settlement monitoring surveys and lease surveys for the Hong Kong Housing Authority.

*Being a Land Surveyor in Hong Kong, what types of jobs have you experienced other than those typical land surveying jobs you mentioned before?*

We have done some interesting jobs which involved a detailed survey of some heritage buildings and structures in Hong Kong for conservation study purposes. One of these examples is the "Lui Sun Chun" which is situated at the junction of Lai Chi Kok Road and Tong Mei Road. We have been appointed by AMO as Government consultant to produce detailed drawings of these structures. A series of detailed drawings including location plan, elevations, floor plans, cross-sections, window and door schedules, as well as tile patterns, etc, is

produced. Another example is the Pottinger Street (Stone Street) and Ladder Street at Central. The outline of each granite and the patterns of these granites are produced. These are not easy tasks due to the requirement of high accuracy. Of course, we may carry out these detail surveys in a faster and efficient way by the use of advanced technologies such as 3-Dimensional laser scanner. Although this technology has been put on the market for more than 2 years, it is still not very common because of the high costs of these instrumentations.

*Have you experienced any problems during boundary definitions other than those typical ones and how did you solve these problems?*

There are plenty of them! I can say that, these boundary problems are all caused by defects in old land records. I have recently come across a very interesting case. The case was about an old schedule lot in the New Territories, which was divided into six sections namely S.A to S.F (i.e. RP will be designated to the remaining portion of a subdivided lot under the current practice) about 70 years ago. However, an additional section of this lot (say S.G) is shown on the DD Control Sheet, the corresponding resumption plans, and of course the Lot Index Plan. The reason why I am quoting this extra section is that it has neither been legally subdivided from the parent lot at that time, nor in the further subdivision, and the Government Rent has never been acquired from this lot due to the unknown owner. Regrettably, there is no division plan annexed to the respective memorial under the said subdivision.

Hence, the crux of the issue was which record carried the correct information? The Control DD Sheet or the Land Registry records? From the interpretation of the DD Sheet and Control DD Sheet, it is identified that the division lines demarcating this extra lot follows the edges of the field bunds as shown on the original DD Sheet which are consistent with those of the old aerial photographs. On the other hand, this lot is included under the "Lots Can't Be Traced" as shown on the Control DD Sheet, showing that the lot is known to have been problematic for a long time.

It is therefore believed that the division lines were possibly drawn on the Control DD Sheet by some untrained draftsman who directly adopted the lines of field bunds as division lines, without further checking the actual total number of divided portions. The other possibility is that a division plan for S.G



would have been passed to the then NTA for process but was lost and leaving the land record as the only evidence of the boundary, or S.G was just a proposed subdivision, but was not executed due to some unknown reason.

According to the Land Registration Ordinance (Chapter 128), only the records, which are registered in the Land Registry, are legal documents. Also, since the parent lot was fully and legally divided into 6 sections (i.e. S.A to S.F) and the total area of those legally subdivided sections, as shown on the Deed of Division of Property, is agreeable to the original area of the parent lot. Hence, it is impossible to include an extra section or otherwise the total registered areas would be exceeded.

As you can see, the problems are mostly caused by defects in these old records and non-standardised practice in the past. This is also why a systematic re-survey is necessary.

*Do you have any suggestion or recommendation on the current land boundary system?*

To my memory, some of our fellow colleagues addressed many constructive suggestions in the past. Unfortunately, most of them are still just recorded on the articles and seldom put to action. It is understandable as the problems are inherited from the past with a history of about 150 years and we should not expect to have an instant change.

The hotly discussed systematic re-survey in the Demarcation Districts is an effective solution to this issue. Most lots in the Demarcation Districts are contiguous with one another in a block, and thus rectifying the boundary of a lot without rectifying the boundaries of the adjoining ones will produce no benefit to the whole situation, and disputes may also arise in a ripple manner as time goes by. To look for a thorough remedial action, all consecutively adjoining lots have to be dealt with as a whole, and systematic re-survey is the way out.

Besides ameliorating the land boundary records and in turn improving the property market in the New Territories, systematic re-survey will also induce a growth to the employment rate in this profession. The profits brought about by this survey are thus long-term. There is no doubt about this. At this stage, the main concern is when to implement.

For the urban area, the records are comparably clear and acceptable. Most of the problems are rooted from the old style lease plan and subdivision plan. Contradicting information in the plans is common. The current Land Survey Ordinance [Chapter 473] is actually a means to prevent the subdivision problem from continual deterioration, and I may suggest re-executing the practice of as-built lease survey upon every development. In this way, high congruity between the boundary information and the existing occupations can be achieved. Fewer disputes


and uncertainties mean faster developments.

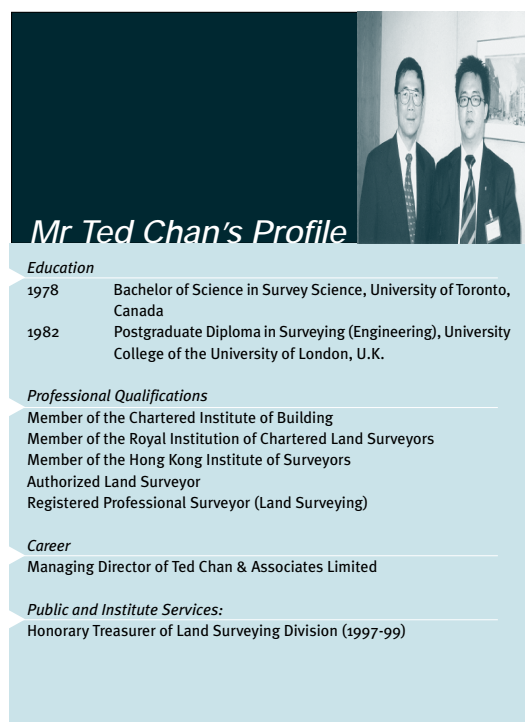
To be effective, legal arrangements are indispensable. The Land Survey Ordinance is a great step forward. The Land Titles Bill is also appreciated as it proposes that a landowner may apply to the Director of Lands for the determination of a lot boundary. But it is still not enough. The provisions of boundary legality and security are the key issues. The systematic re-survey will also be practicable and effectual only under law prescription.

Besides, in my opinion, boundary enforcement, establishment and preservation of boundary marks and promotion of boundary consciousness to the public are also important.

*Many land surveying firms are diminishing. The Government provides only contract or temporary employment. What are your advice to the graduates and young surveyors nowadays?*

No matter what discipline they take, graduates in recent years are facing tremendous pressure in planning for their career path. I note that some of those fortunate enough to acquire job opportunities in large enterprises are actually having triple workloads but receiving only one-third of the original salary. To survive is not easy, and survival or success depends on what they are focusing on. It is actually the best time to equip themselves to face future challenges. Their workloads are so heavy that they can learn the most within the shortest duration. Knowledge and experiences gained are what they shall count for.

In this era of information technology, every profession is affected and is trying to cope with this trend. Graduates and young surveyors shall reinforce their foundation and may think of specializing themselves in advanced technology, particularly for those relevant to our profession such as GIS and advanced survey techniques. Our profession will certainly move on in this direction in the future. 



**Mr Ted Chan's Profile**

**Education**

1978	Bachelor of Science in Survey Science, University of Toronto, Canada
1982	Postgraduate Diploma in Surveying (Engineering), University College of the University of London, U.K.

**Professional Qualifications**

- Member of the Chartered Institute of Building
- Member of the Royal Institution of Chartered Land Surveyors
- Member of the Hong Kong Institute of Surveyors
- Authorized Land Surveyor
- Registered Professional Surveyor (Land Surveying)

**Career**

- Managing Director of Ted Chan & Associates Limited

**Public and Institute Services:**

- Honorary Treasurer of Land Surveying Division (1997-99)