A Hong Kong Project

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This talk was presented to the IQS Branches' Conference on 3rd December, 1982.

It all started with a film. In the late winter of 1977/78 whilst working, between postings, at the Hammersmith head office of Wimpey, I succumbed to hotel induced boredom and went to the pictures. The film had used Hong Kong as a backdrop, and so when I was told next day (quite unexpectedly) that I was required to "look after the Quantity Surveying" on a housing project in Hong Kong. There was not too much argument about the details!

So far, so simple. What could possibly be difficult about spec. building, even if it was a bit far away. But as usual, life is not as simple as it seems.

First, the project. A site of about 138 acres, formally an orchard owned by a warlord, General Lee, who moved over into Hong Kong before the war and lived there with his wives and concubines. He had died after the war and the orchard had fallen into disrepair. It came into the present ownership in 1976-1977 and plans were made to convert the land into a luxury, low rise housing development. When completed, there will be about 1,000 units, of various sizes on the re-formed and roaded site. This is a fairly adventurous project for Hong Kong where developers tend to stick to what has worked before, up to the point where it has been flogged to death. It was even more visionary, when conceived back in the mid seventies.

I was involved as company quantity surveyor from 1978-1980 and then as general manager which made the transition from QS to project manager a little easier, being familiar with the project, at any rate!

I will come back to the project management later, because it is there, really that the project ceases to be comparable with a UK private development.

First, though some explanation of what has been built and the techniques used.

It starts with civil engineering. Before this beautiful old orchard could be used for the houses, it had to be turned into a site with satisfactory levels. Whereas in the UK you would reject a site requiring extensive regrade to form it, the situation in Hong Kong differs, because of the absence of suitable unused land. So we had to make this site buildable. This involved a balanced cut and fill totalling about 2 million cubic metres, and in order to yield the maximum land possible, cut slopes are made at 5 in 1 and ten metres of fill was not uncommon. The slopes have to be cut (or filled) carefully because of the stringent controls exercised through the Hong Kong government's Geotechnical Control Office. The origin of this control is landslides and bad rock, and not a few disasters. The problems of forming the site in phases also arises because although the overall balance was all right, to establish building phases was a little more difficult due to local imbalance.

This problem is exacerbated by a tradition peculier to the part of the world involved. It is known as Fung Shui, which is an old tradition of Geomancy. The two words mean wind and water and the theme is the relationship of the two, to peaceful and secure living. A long time ago, it was good, logical planning, like not building a house too near the junction of two water courses, having a grove of trees at the back of the village (for shade, firewood, etc.) and the relationship of the village to the hills (giving good shelter from typhoons, and winter winds etc.) The philosophy goes so far back that it is now enshrined in superstition.

But it is a very commercial situation. Graves and urns containing human remains were positioned for "Fung Shui" reasons. To move them for a development involves interfering with the peace of the ancestors. The theory commands respect. The practice is exploitive. A common story (offered here as no more than the hearsay it is) concerns an engineer who was pegging out a road line. Having discovered a rather extensive urn complex within the trace, he pegged out to one side. Next morning the urns had moved into his new peggings. He was then able to "discover" his error and realign so to avoid the urns and the compensation which would have ensued! This unusually commercial attitude from an engineer should entitle him to some added recognition from quantity surveyors. We had our Fung Shui problems as well. The difficulties in getting to a phased cut and fill balance were not made any easier when we got urgent requests from the village consultant to cut down a particular hill, way out in front of the phasing. The resultant claims negotiations tended to be difficult.

As well as regrading, attention had to be paid to the requirements of rainfall within the subtropical typhoon belt, where 100mm of rainfall within one hour is not uncommon. Hong Lok Yuen is located within a water catchment area, so all the run-off had to be put through a series of stilling basins to ensure that what went down into the government water treatment plants did not contain an unacceptable level of suspended solids. A comprehensive system of temporary drains had to be laid over the formed site to ensure that up to the time the development phase was completed, the run-off did not scour the filled surface too much. This rainfall that I mentioned earlier is capable of eroding thousands of cubic metres off the surface, and dumping it in the stilling basins. There is very little point in cutting and filling to a given level, if a typhoon comes along and dumps the top couple of inches right down at the outfall! —hence the temporary drainage.

An on-going feature of this formed and drained site is the requirement to have a lot of people on rainfall standby. Rain and wind sometimes go together and one piece of polythene waste, blown over a drainage inlet can create quite an obstruction. Given the high intensity, a simple, casual, blockage like that can cause a major back-up and water pressure is not friendly. We had one case where it knocked over three boundary walls and flooded a house to a depth of two feet. This is not uncommon.

There was no public foul sewer to receive the inevitable, so a treatment plant had to be built. This comprised a treatment plant providing full biological treatment to attain the royal commission standard of 20:30. Incoming sewage is lifted by screw pumps, through comminutors and then into aeration tanks where surface aerators are used to transfer oxygen from the air to effect biological decomposition of organic matters. Sedimentation is in hopper bottom tanks and the activated sludge is returned to the tanks with surplus being diverted to a sludge holding tank so that the surplus can be fed into the sludge presses for dewatering. Treated effluent is then discharged into the outfall pipe.

It had to be built early, so as to be ready before first occupations, and also capable of functioning on a range of population between a few, and five thousand. Another additional problem was that the water authorities insisted that the treated effluent be carried out beyond the catchment area, which meant a 2km pipe laid in the public highway. They also insisted that it, along with the whole foul system, be in cast iron with hatch boxes at the manholes. This insistence caused a lot of mind searching back to the old text books! There was, however, no way in which the authorities could be persuaded to accept modern materials!

Another aspect of the advance preparation was that we had to construct a new access road of about 1km and a bridge over the Kowloon Canton Railway. As modernisation of the railway was under way before we started, this bridge had to be constructed to new standards (it was replacing an old Bailey Bridge) and it also should have been completed prior to first

occupations which were expected in April 1980.

I say "should have been" because it was here that we met our first (and, to date, only) programme failure. As a result of difficulties on another contract, our civil engineering contractor for the bridge and approach road went bankrupt. This set us back about eight months and I got my first look into the complicated way in which contracts and subcontracts are structured in Hong Kong.

Normally bids are received on bills, same as British practice, contracts are let, generally to firms having a record of previous work of the type and the project gets built. Under this, there is a complex relationship of major and minor subcontracts, with practically everything sublet, sometimes the bulk to one subcontractor. This is acknowledged in the contract, where the architect or engineer only has a reserved power to prohibit, rather than a positive approval power, for subcontractors.

So it came about that when the main contractor failed, we unearthed a subcontractor who had, in fact, been doing all the work. He, amongst others, slapped a writ on what was left of the main contractor. This writ specified the terms of the subcontract. It was quite extraordinary!

It read:

"By oral agreement made between the plaintiff and the defendant some time in March 1979 at the defendants office, the plaintiff agreed . . . inter-alia, the following contract terms."—There then followed two pages of quite specific items which indicated that the plaintiff had the power of almost total recall on what he had verbally agreed. I say "almost" only because of the term "inter-alia" which had been used. In fact, the oral contract was apparently quite specific.

We had to re-enter the works and appoint another contractor in order to get moving again. In spite of the bond, it was also a quite expensive exercise. This chapter of misfortune went on after that because it then took a writ from us to get the bond paid.

Taken all round it was quite an experience!

For the first phase of housing construction, we let the road, drains and services to the housing contractor so that he could get on with the whole works in a phased and integrated manner. That was our intention, but it took a lot of persuasion before we could get him to do the road works before the houses. Ultimately he was persuaded to do the main sewers and road to base course in advance of the housing but it was only much later that he became convinced of the merits.

Estate roads in Hong Kong tend to be wider than you would see in the UK and are built to quite a high specification standard. Rainwater drains are all concrete pipe and are larger in diameter, as you might expect from my earlier observations. Foul sewers are all cast iron, sealed system. Manholes are always constructed of institu reinforced concrete which tends to slow things down a bit, and if you are not careful extra settlement results to the backfill around the larger excavated holes. There are also two separate water services distribution net works, being fresh water, and flushing water which is generally salt water throughout Hong Kong. Although there was not a government salt water supply available at our development, we still had to put in the mains. We also had to make provision for an indirect supply of both types of water, from two very large header tanks upon the surrounding hills. As an alternative to the government flushing supply we have also installed a system for pumping the treated effluent up to the storage tanks for use in flushing. This will not be activated until the technology of water treatment advances to the point where it is safe, but is up there waiting for science to catch up!

Along with everything else as you might expect, house construction is also a bit different in Hong Kong. Hong Kong is mainly high rise flats, with only a small amount of low rise. So the low rise uses methods derived from the multi-storey techniques. The houses are mainly what is known locally as "Spanish" style and are constructed of concrete with a few bits of block or brick infill. Foundations, walls, floors and roofs are all reinforced insitu concrete. When the shell is up, cement and sand rendering and lime plaster are liberally daubed over everything it will stick to. This covers up the concrete which in all conscience needs covering! Reinforcement is well done and is efficient (the fixers do not even get bending schedules) and the concrete standard mixes are very strong. The formwork techniques, however, are unbelievable. They patch up shutters from any old plywood offcuts that are lying around and the strutting is generally of a poor quality. Even on our site, where they had repeat prospects of up to 60 uses, the concept of formwork design could not be introduced because the subcontractors concerned are just too traditional. As a result of this, vibration is carried out with a degree of caution that would do credit to a transporter of nitroglycerine! The consequence of all this is a lot of honeycombing and a rather loose approach to line and level, hence the plastering. The outside is generally finished with an exterior thick coat surface finished to the desired pattern. Roof concrete is waterproofed. Has a waterproof screed and tiles, either clay or concrete coloured. Windows are generally aluminium framed and preglazed (in our case bronze anodised and tinted glass and the whole shell is then roughly waterproof. The finishing trades (again mainly subcontract) work through, but there is a lot less timber than here. Plumbing is galvanised iron tube, with this very bad overseas habit of getting buried within the walls and floors. Because of the use of subcontractors, there is a tremendous amount of waste and debris. The rule seems to be that each trade cleans up prior to starting only to the extent necesary for them to do the work and what is left gets carried over to the next trade. At the end, there is a general clear out and incredible volumes of debris get moved from A to B and back to A again, so that the external works can be done.

In addition to what I have described so far, we are also just completing a town centre, with a country club and small shopping mall. We are also about to start a small school.

Contracts are generally let on a "without quantities" local variant of the JCT form and the local contractors seem quite hot on confirming VOs which would make the final accounts a lot easier, if the number of VOs was kept to a reasonable level. The local contractors are also becoming quite switched on to claims as a means of overcoming losses, but there is a lot to learn about procedure.

The overall project management with which I have become totally involved since 1980 has quite a wide area of function.

There has to be a considerable volume of liaison with the Hong Kong government, about development control, although I am not able to compare in detail with UK procedures, because I never did a job at this level before going abroad.

Control on development is generally exercised by fixing maximum gross floor area, and site coverage, or the plan area of the buildings relative to the site.

So we were granted a plot ratio of 0.4 and a site coverage of 0.2. This meant 2.2 million square feet of buildings, mainly domestic and communal.

Master layout plans are approved prior to starting and the "design, disposition and height (known locally as "DD and H")" of the buildings is approved separately. This works out well on high rise and small sites, but is more involved on larger, long term developments where sales and marketing reasons may make frequent adjustments desirable. Each such adjustment means a revised master layout plan, and another series of discussions with government ending, we hope, with approval.

There is also an involved system of building control, so that practically everything to be built requires the prior approval of the building authority, fire services dept., water authority, and lands dept. Work cannot start without written consent and the majority of building amendments need approval. When work is complete, the authority inspects and, if all is in order, issues an occupation permit. Prior to this op, the water authority and fire services dept. (if needed) will also certify compliance.

It is only when the op has been issued that the sales can be legally completed, so any last minute snags can (and frequently do) mess up the cash collection!

On a large site such as this, the coordination of the various contract activities is also of the utmost importance. Having got the regrade and site formation activities into a phased order, the other construction contracts follow on and for the first phase we had to bring on the sewage treatment plant, outfall sewers, utilities and the bridge, so that once the houses were ready to be transferred to the owners, they were able to use them. The work involved in keeping the contractors in the right order was quite involved, particularly those which were vulnerable to the weather. There are a lot of imported components, sanitary fittings, kitchen units etc., which have a normal 3 months lead time. So when, in 1979, we got the once in 4 years typhoon and had the store sheds blown literally all over the valley a lot of fairly slick footwork and fast decisions were needed in order to minimise the time lost in waiting for import replacements.

It is also necessary in Hong Kong to achieve a high level of separation between the contract works areas and the completed and occupied areas. Delivery trucks are driven too fast (a common habit there) and they are not as responsive to good road discipline as are the drivers back home.

Of course, budgets and cash flows are vital to the financial control. This is particularly true of a long duration project in Hong Kong

which will span a number of boom and recession times. Being a free market, these tend to be more frequent and the ups and downs are magnified. Thus the cash flow breakeven is important and works of a less than vital nature must be slotted in to suit the availability of funds. This sometimes conflicts with the marketing desire to get such items as shopping and recreation out of the way early. A balance has to be drawn which gets them in as early as possible, without extending the period of outside finance use.

It is common in Hong Kong to pre-sell whole phrases and then to build them. In a boom period this introduces speculation and buyers will trade the houses on margin. When the boom tails off, the speculators will unload and, therefore, it becomes more difficult to collect the completion money. This speculation must also be borne in mind when fixing price rises between phases.

Right now, we are "between booms" so to speak and there is an absence of speculation, but it will undoubtedly return, some time, to haunt us again!

I have also been lucky enough to be involved in the sales and marketing strategy. This area is not, I believe, yet covered in the training of a QS, and so I came to it as green as grass! Amongst other lessons that were picked up, I learned that selling houses is not an easy exercise. Advertising them is even more difficult and obtaining a theme around which to base a strategy is almost impossible, because people have so many different reasons for preferring development A, to B! We seem, for the present, to have settled on a "quality of life" and "value for money" theme, which will hold us until the government gets the new railway and road out of the new town of Tai Po, where we are located. Prior to this, we do have a time and driving handicap. Strangely enough, we are constantly battling against an early "exclusivity" image, which keeps away quite a number of people who could really afford it—just like dinner at the Ritz! Also, in a relatively close environment gossip and rumour plays a large part in the life of the community even in the press, radio and TV. It is like a big village really, so we have a PR agency whose main concern is to protect the image we are striving to build up, and head off the bad gossip (whilst, of course, encouraging, in a negative way, the good!)

The PR aspect leads me into the next main area of attention, which is management of the occupied areas. Again, it is not quite like England. The government (local authority) do not adopt roads on private estates, although they reserve the right to! The Hong Kong Government is not keen to expand its areas of financial commitment, so if somebody builds a housing estate, he will have to look after it! They do not want to create slums, or dilapidation however, so they make the developer take over the job, and give him rights on the owners to recover the costs of managing the property. This is called a "Deed of Mutual Covenant" and requires a property management company to look after it. This company can charge a reasonable fee, levied on the owners, in addition to cost, so it is something of an "easy money" route. Until, that is, someone actually thinks responsibly about what is involved! Most developments being one-shot multistorey, the management company is only established *after* all the properties are sold and so the management can be pretty crude, but will not affect sales!

This is absolutely the wrong way for us to go about it, because a long term project requires a good reputation all round, which it will *not* get if the management is bad!

At the front end of this so-called "Property Management" is security. Local opinion demands a visible private security presence to act as a deterrant to casual crime. Main gate control must be seen to be efficient with plentiful patrolling within the estate. We cannot really win on this one, as someone some time will always be able to get through. But we must be seen to be doing our best.

Another responsibility of property management is to police the development for illegal structures. We do not really like this job, but it has been worked onto us through the lease. Briefly, the position is that the approved buildings plans upon which the occupation permit was obtained cannot be altered after completion, to any great degree. So nobody asks permission (which would probably be withheld) and most people just get on with altering the houses, which the government does not like!

As if all that was not enough, we have a country club to supervise (including catering) and the town centre to let and adminster. These last two are my latest adventures and I cannot yet say much about them, because I have not learnt much yet!

So that's Hong Lok Yuen. Four-and-a-half years of developing "deep end" type experience, latterly, I suppose, straying over into RICS general practice work. I suppose that if this kind of project management takes-off, then the additional experience gained from being within the multi-disciplinary institution could be useful. But then again, I do not really know how much interchange there is between divisions. We will all know soon.

I really believe, though, that the UK QS experience is a great advantage in adapting to the more general sphere of commercial project management. However, I think that the experience should have been gained out on the sites, and the bigger the better!

Nobody ever learnt project management by taking off quantities!

Just a few acknowledgements. To Wimpey for letting me come here today, and to our Hong Kong partner, Mr Clifford Wong, without whose broad experience in the area, we could not have achieved what we have. Also, we have an extremely competent local staff, at all levels, who really (as usual) do all the work!

Micro Computers and the Construction Industry Commissioning the System

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The third and final in a series of articles designed to help the reader decide whether a micro computer can help him in his business and learn a little of how they operate.

Running and Testing the System

Except in the simplest of applications it is not possible to switch immediately over to faultless computer system operation. The ideal is to do a dummy run manually with the proposed new system before actual purchase of the hardware to make sure everything runs smoothly. This is not often possible and there is usually a period of parallel working with the old manual system side by side.

There will always be problems, there will be bugs in the software, the inexperienced operator will press the wrong button and lose all the data. Something is bound to go wrong. The normal expectation is one bug a day for the first week, one a week thereafter for the next month and only after about 3 months operation will the new system be running smoothly.

The usual reasons for these startup problems are inadequate system analysis in the first place, poor briefing and specification