



**FROM THE GROUND UP:
DESIGNING AND BUILDING A NEW CITY IN CHINA**

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Vancouver
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Biographical Note: One of Canada's most outstanding architects, Bing Thom has just been chosen by the Chinese government to design Dalian New Town, an instant port city to be built on the coast of the Yellow Sea. This extraordinary project will take over 30 years to finish, house 1 million people and cost ultimately over \$700 billion.

I'm going to start with a short video clip that the CBC recently made with me in China. They came this fall with Joyce Resin and Patty Moore from the program called *Alive*. *Alive*, as you know, is a television program that runs every week and basically deals with health, and they thought it would be interesting to talk about healthy cities.

In the north of China, a dream of a city — a healthy city — is coming true for well known Canadian architect, Bing Thom. He is in China with a team of developers, engineers and planners and with some well established credentials. Bing Thom has received the Order of Canada for his architectural designs around the world and he has a vision for this land. As far as healthy cities are concerned, China has not been very successful to date. In fact some of the world's worst examples of problem cities are found there. But this area is different. This beautiful coastline, only 300 kilometres east of Beijing, in the area known in ancient times as Manchuria, is on the outskirts of a city known as Dalian. The existing city of about 3 million people is cosmopolitan, dynamic, and

bursting at the seams. This thoroughly modern metropolis prides itself on being beautiful, stylish, and worldly. The spark plug is the forward thinking “can do” mayor, Bo Xi Lai, (he’s described as a young Jack Kennedy). This city is specially favoured by Beijing to be a “world class” example of China’s face to the future. Growth here has been exceptional, even by fast paced Asian standards. Dalian is attracting billions of dollars in capital investment from around the world. And those investments are attracting millions of new citizens, Chinese and foreign. They all need somewhere to live. And that’s not a simple task. And the mayor wants a city that’s not just the biggest, but the best. “Of course, Dalian is a Chinese city. We still keep some Chinese traditions, but at the same time, I invite European designers to come here to create something special.” So the mayor set up a design competition to build a New Dalian. Architects from around the world competed. Bing Thom’s team won the competition. In September, mayor Bo Xi Lai gave a green light to his dream for Dalian. And with that approval, construction work has begun on the world’s newest “healthy” city. Bing Thom is confident that people will be living in New Dalian by the end of this century. From dream to reality in just three years from now.

In designing new Dalian, we’ve paid a lot of attention to history and culture and this was very surprising to the local planning officials. For example, my colleague Mr. Liu Dongyang found in UBC’s Asian Studies Library a map of the Dalian area dating back to 1566. [Figure 1] After we made it available to the city – and the mayor especially — it appeared in the local newspaper the very next day. Prior to that, when we asked questions about Dalian and its history, they thought the city was 100 years old because it was built by the Russians and the Japanese. They were very quick to pick up the information that we found. The farmers and fishermen all knew about the

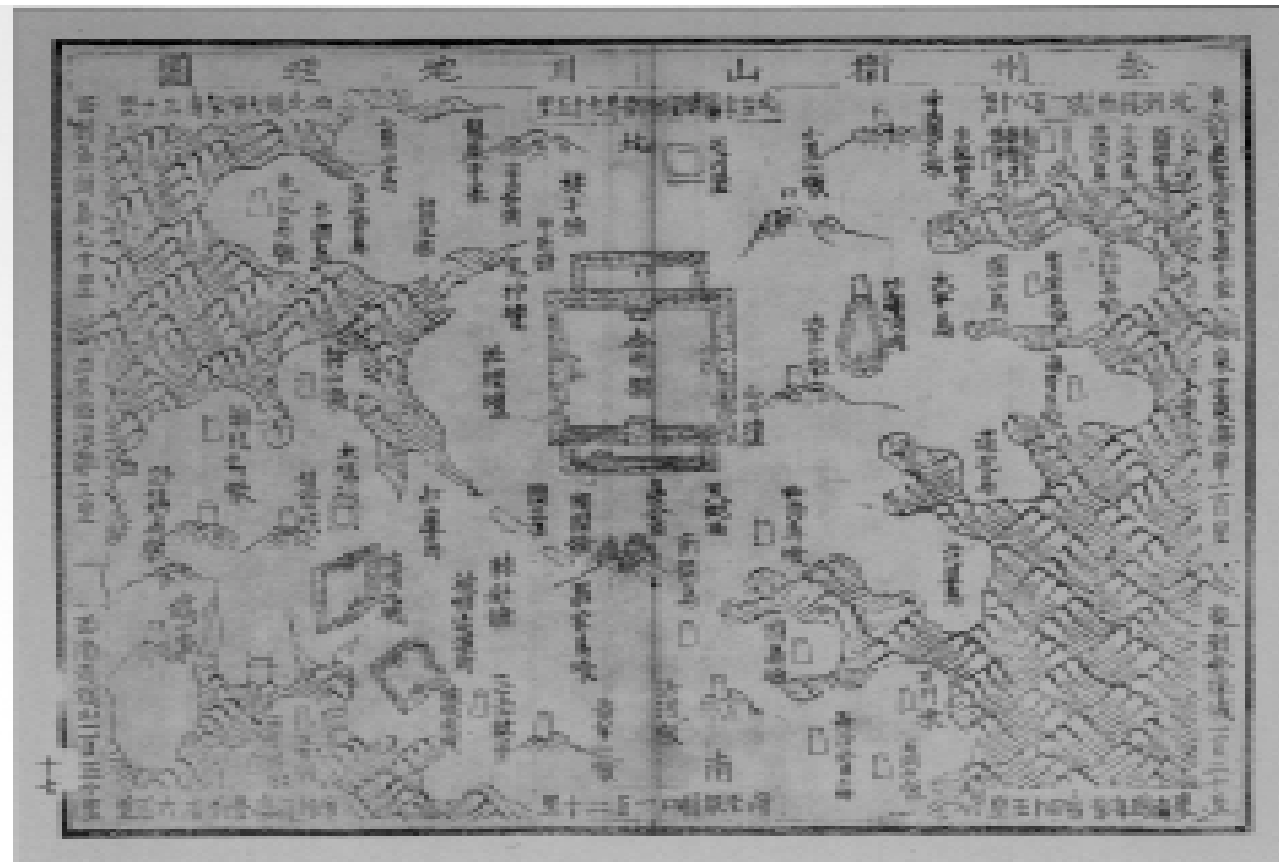
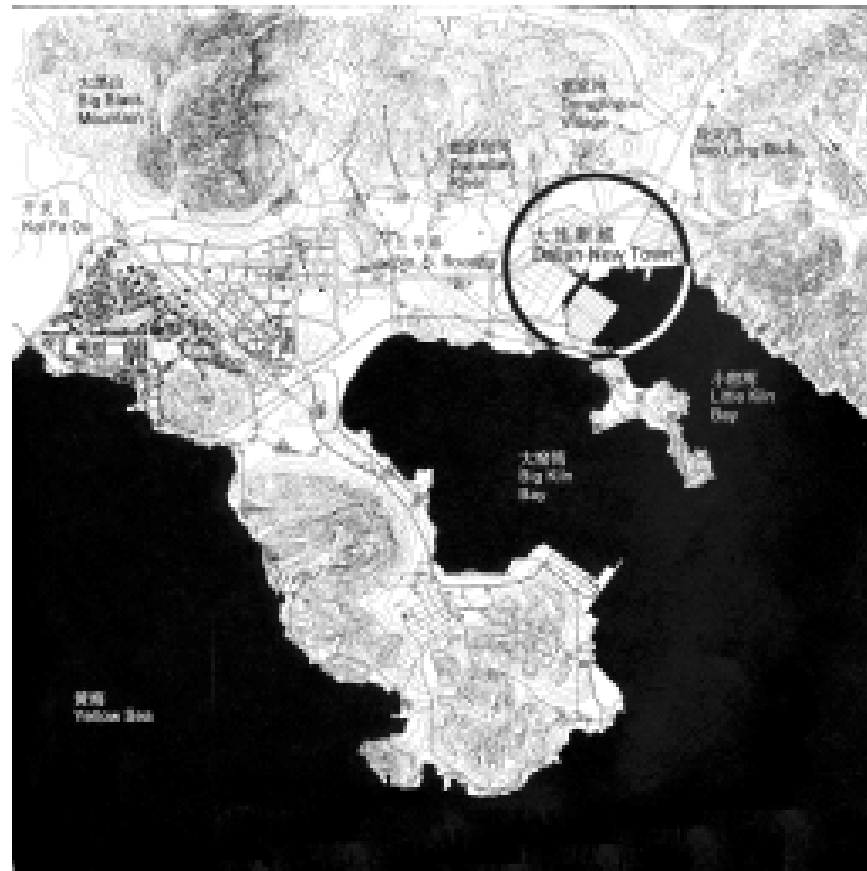


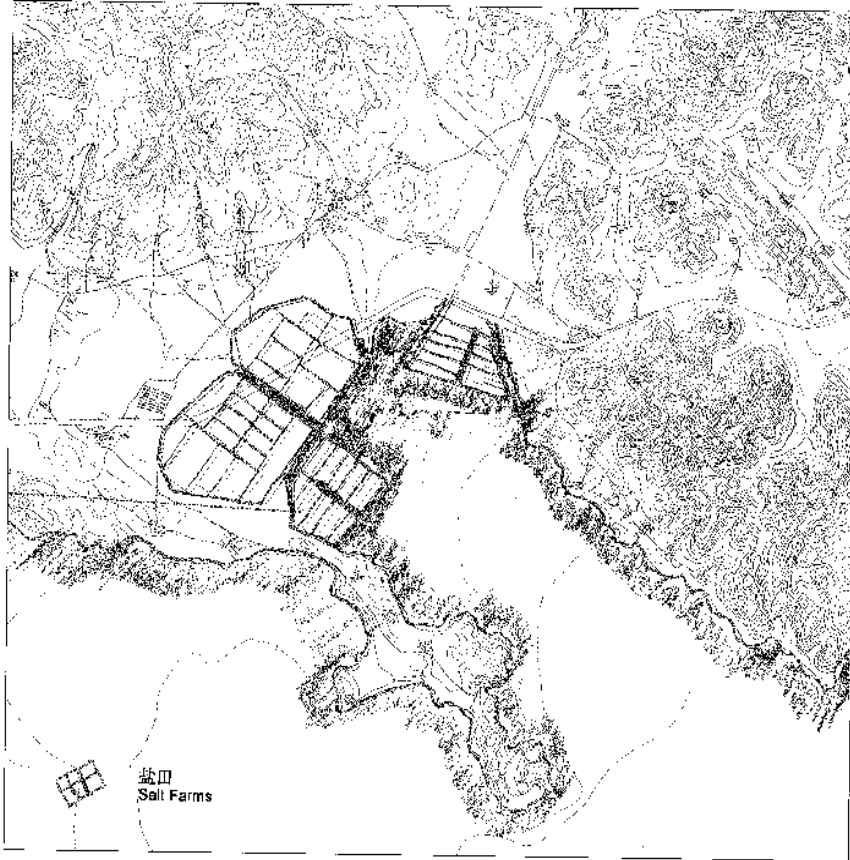
FIGURE 1: Dalian Region, Ming Dynasty, 1566

mythology of Big Black Mountain, one of the important local natural features, but the planning officials who were all from Shanghai and Beijing had never visited the site nor knew that there were temples up the mountain. This is despite the fact that some of them had lived in the area for seven years. So they began to think of planning a little differently through the experience of working together with us.

Figure 2 presents a map of the region, including Small Kiln Bay, Big Kiln Bay and the local topographical features. Existing on the site were a series of salt farms, [Figure 3] and we were supposed to create the new city by filling up these farms. They had also built

FIGURE 2



**FIGURE 3**

a major highway through the salt farms, [Figure 4] planned by some highway engineers out of Beijing. The widest roadway we have in Vancouver is about 40 metres, property line to property line. This highway was about 120 metres wide, so obviously they were thinking of it for grand parades and whatever. It is also potentially one of the major coastal highways linking all the way to Korea. [Figure 5] You could drive from this area to the border of North Korea probably in half a day. One reason why Dalian was purposely not developed until recently is because it's on a very long peninsula and the central government was very worried that Dalian could be totally cut off from the mainland by just a series of bombing raids. That con-

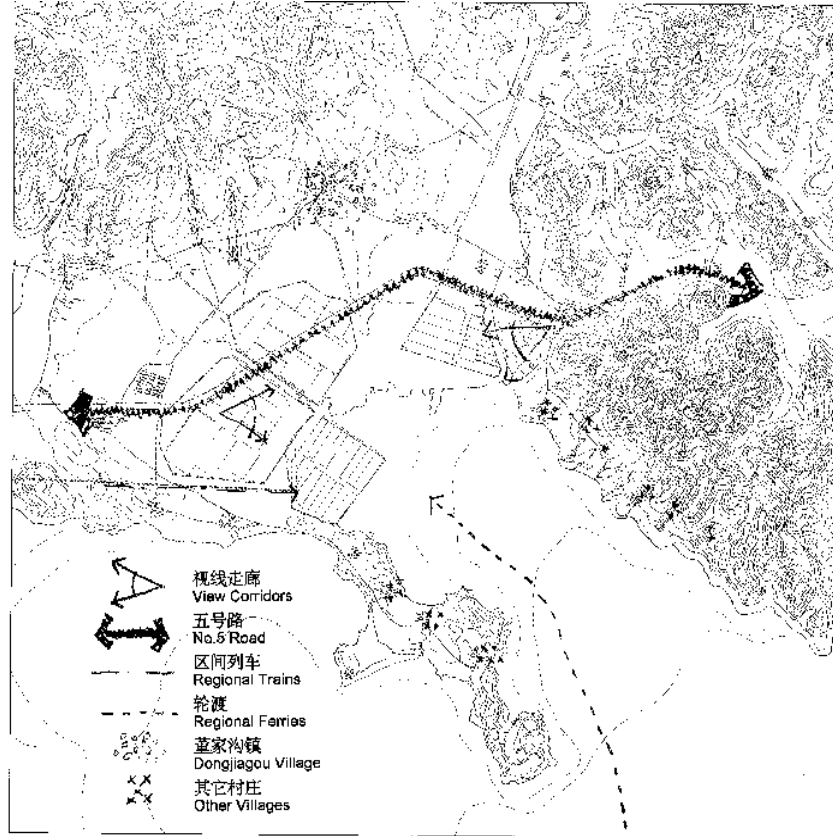


FIGURE 4

cern was clearly left over from the Korean War. So it wasn't until the late 1970s and '80s that Dalian became a vital port for China. It's the best deep water port for all of Manchuria with a regional population of 100 million — i.e. virtually half of the United States population serviced by one port. That's why it's so important.

There are two major rivers, let's call them streams, that drain into Small Kiln Bay. The dotted line in Figure 6 shows the low and high tide lines. This is very much like Spanish Banks. It's probably twice the walk from shallow water to deep water, so the tide recedes for a long way, and that's why it was so successful as salt farms. But it became a major problem — how do you design a sea front city



FIGURE 5

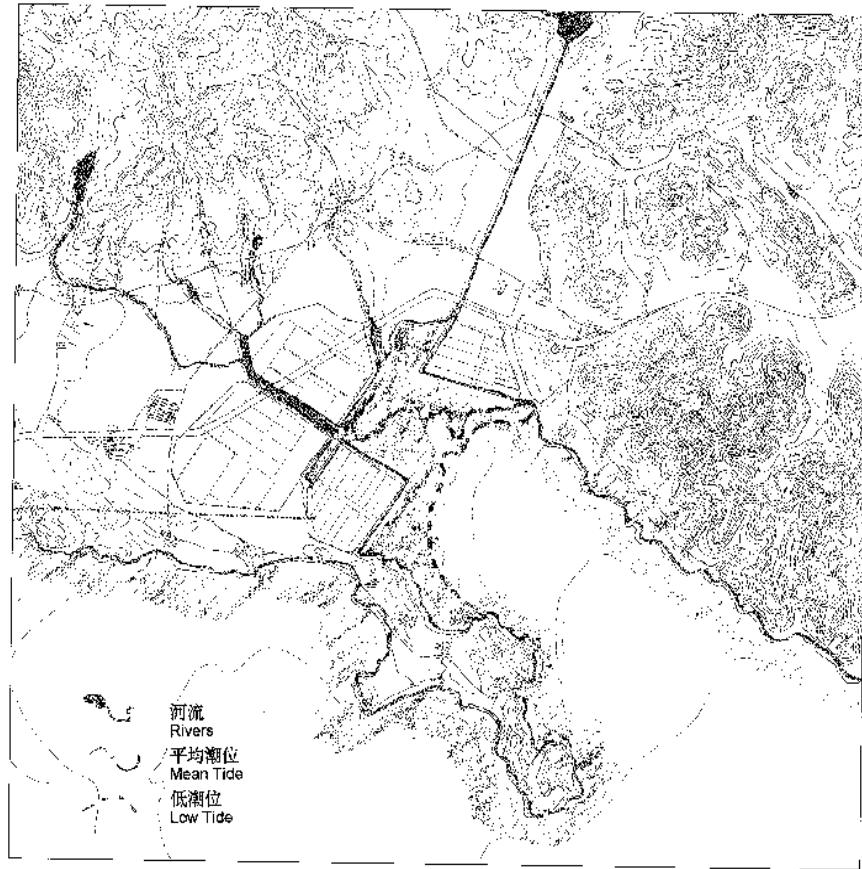


FIGURE 6

when you have tidal conditions like that? In Big Kiln Bay, they didn't have this problem; but in Small Kiln Bay, you have the tidal flats.

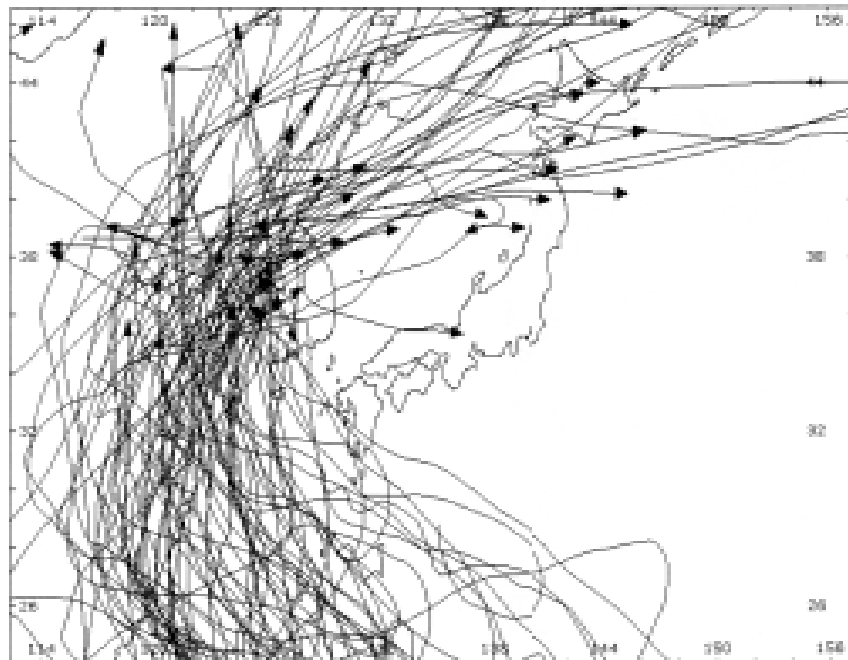
Figure 7 shows the record of 72 typhoons that came through Dalian. When we first got into the job, we had a sense this might be a typhoon area so we made a long distance phone call to the chief planner in Dalian and said, "You know, we are really worried that maybe you've got this new site right in the middle of a typhoon path." And the chief planner said, "No, we don't have any typhoon problems." One week later, after the phone call, we made a site visit to Dalian and the typhoon hit and destroyed a new dike that had just been built. We spoke to one of the local farmers and he said "Well,

of course, because the planners are living in old Dalian.” Old Dalian is very ingeniously sited because it had a mountain range to protect it from the typhoons, but this new site is right smack in the middle of the typhoon path, and he said “Well, these guys never come to this site. Of course they don’t know about this problem.”

There are fishing villages currently located in Small Kiln Bay. Because of the tidal flats the fishermen have invented ingenious ways of taking their small boats up onto the shore by a type of cable car. The villagers built beautiful little houses up in the hills. They have this tremendous love of a blue colour that we saw everywhere, and the villagers were always very sensitive to the local environment — they never built on top of the hill, they always left the top quite pure and then built terracing down from the hill.

So we then said, how do you go about designing a new city? The best way is to start from history and look at what other people

FIGURE 7



have done. [Figure 8] There are defensive cities — very compact, working with nature and leaving large areas of farmland and not allowing the city to sprawl. There are imperial cities. And there are modern capital cities like Brasilia and Canberra. Brasilia is a failed capital, but Canberra is very interesting. It is laid out in a series of geometric, star-like patterns, and uses the mountains and the lakes for axes and vistas. But obviously for architects, if you get too hung up on geometry, it has its own way of stifling growth and creating patterns that are hard to deal with through time and change of values. Then you have mercantile cities. New York is very similar to Vancouver where the immediate pattern of the streets was dictated by the wharves and then the grid breaks down. Amsterdam, in contrast, starts from the sea front and grows in concentric rings.

So we had to study all of these kind of patterns because, ultimately, we had to lay out some kind of grid. After the Second World War, fresh ideas developed about urban design including new linear cities that can grow infinitely in any direction; that is, they have grown in arms or a hook. These linear city concepts had a very strong influence in China. In their original 1993 Comprehensive Master Plan, the planners wanted a linear downtown for Dalian that stretched some 4-6 km in length which would have resulted in a long sprawl.

We also had to look at sea front cities such as Venice and some other villages in Italy. The concept of sea front property as a valuable asset and the whole idea of taxation was something new to the Chinese. We had to explain to them that when you lay out a city, you have to think of income that you derive from this land and how to deal with property tax. Of course, China itself has a tradition of canal cities like Suzhou, the Venice of China. The reason we looked at these cities is that the salt farms have canals. We had the idea that maybe we should save the footprints of these canals as the beginning of a canal-like city for the new Dalian. We considered the whole idea of developing bays and waterways and looking at increases in property values that can result from proximity to the water's edge.

And then we started to look at grains of cities — city blocks — including Venice of course with its canal, and Savannah, Georgia, which has a very interesting style based on a repeated pattern of

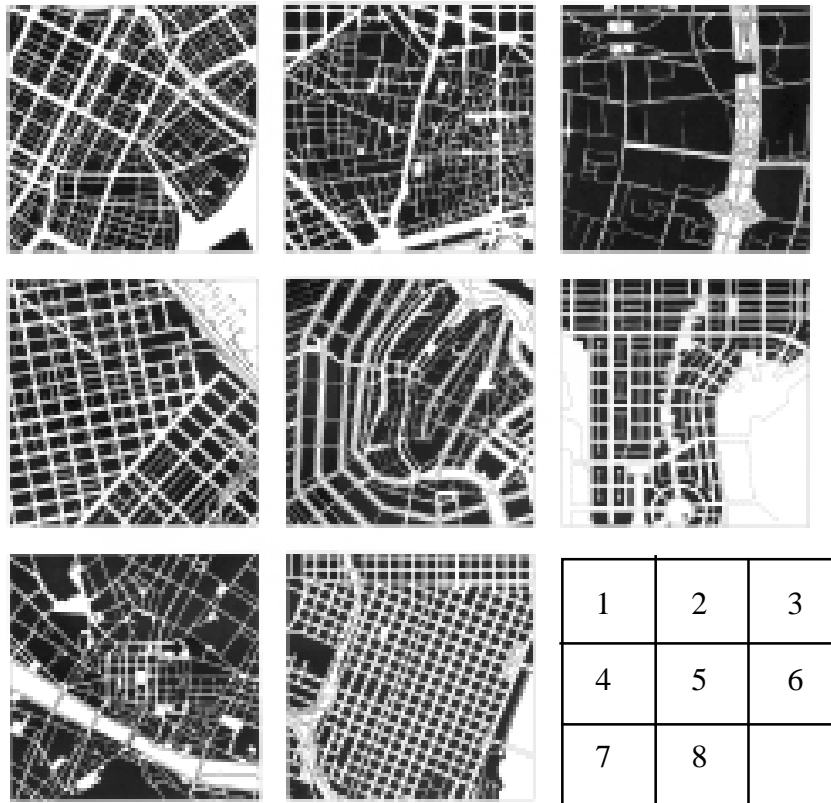


FIGURE 8 - (1) Tokyo, (2) Barcelona, (3) Brasilia, (4) San Francisco, (5) Amsterdam, (6) Proposed New Dalian, (7) Florence, (8) Portland

squares and blocks as the city grew. To this day, Savannah, Georgia, is one of the most interesting small American cities to visit because they kept this pattern going as the city grew. There is also the whole question of sprawl and how to deal with the automobile. We have to be very conscious of this in trying to find the right grain for the new city. Then we thought about Chinese cities, and one of the interesting things about traditional Chinese cities or even older cities in Asia is the idea of mixed use. Zoning is something new in China, so they were all keen to copy North American or British zoning with separate industrial, commercial and residential areas. And we said

“No, we’re changing all that. We now believe in mixed use.” It took a long time to make them understand that the theories of the 1950’s are no longer what we apply today in North America.

Then we said to them, “Well, in terms of the program, how big should this new city be?” And the chief planner said, “Well, the mayor says ‘about 1 million.’” Then we said, “Well, how sure are you of that?” and they said, “Well, we’re not sure. Maybe you should design it so it could be one million, or three million, or five million, just so we can hedge our bets!” So we came back and said, “We’d better look at this more seriously.” We did some more research on other cities — Vancouver, Hong Kong, San Francisco, and Frankfurt — and some are one million and some are six million. [Figure 9] Interestingly enough, there is a scale and an order, because city centres in terms of face-to-face interaction are about a 15-20 minute walk across — that’s about what people can take. You can look at the city of Vancouver today — the downtown is not going to shift, it will just become more dense. If you look at Hong Kong, the same thing has happened since the 1950’s. So, you may have downtowns that jump, because they pass beyond a certain scale for walking distance. They tend not to work any more and require a new centre to be developed uptown. Houston is an example of what not to do. They’re very proud that there’s no zoning in Houston; you can build anything, anywhere as long as you have the guts.

Figure 4 showed the location of the big highway that they’ve built. Unfortunately that highway runs in the opposite direction of the drainage patterns. Because of the salt farms, the tidal differences, and the rain that all comes in one month of the year, the freeway became a dyke. On our third visit right after the rain, a large area above the highway was flooded because the roadway was built high enough so that it was above high tide; but tidal change was, like Vancouver, about 16 feet. So this bloody highway was up 20 feet from where the ground was at low tide. We had to really think how we were going to deal with this. It was built, it was there, it was a major arterial.

We knew that they filled the highway, and they wanted to fill the rest of the land to that high level similar to the way we filled

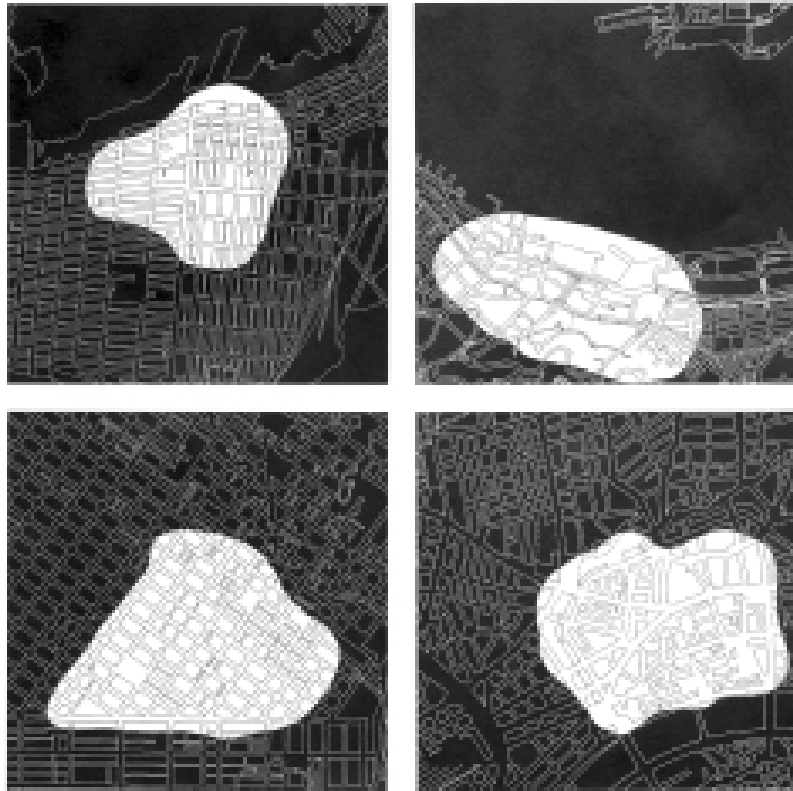


FIGURE 9 - Vancouver (upper right), Hong Kong (upper left), San Francisco (lower left), Frankfurt (lower right)

False Creek here. It's an easy way to create real estate. They were just bull-dozing down the local hills to create fill, and we said, "Stop! We have to think about cut and fill. We're not going to fill everything." We did some diagrams to show them how you could balance cut and fill to create more water. And they said, "We don't want more water, we already have enough water. We want more land." We said, "If you create more water's edge, the land will become more valuable and, therefore, your tax base would be better than allowing the city to sprawl."

Figure 10 shows a number of proposed city orientations and we thought that maybe we could create a lagoon — or inner basin —

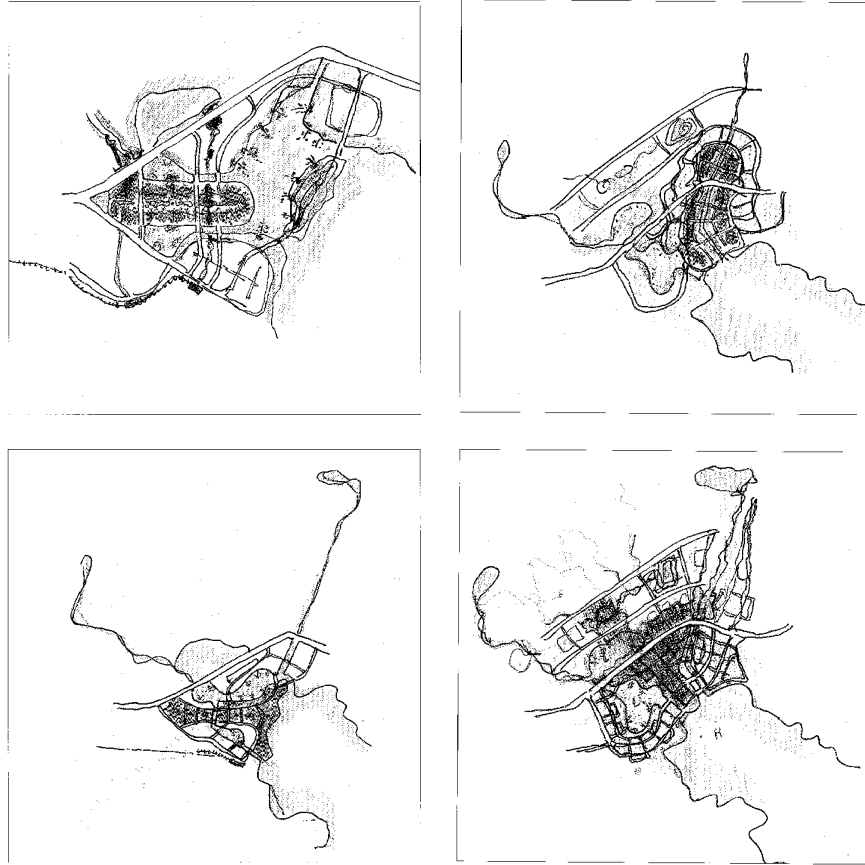


FIGURE 10

and take care of the typhoons with a built form to shelter the winds as they come through. But the trouble with our first design was that it was a great, interesting city, but it didn't feel like a waterfront city. We then had this idea of turning it 90 degrees so you present a small frontage to the typhoon, then we created inner bays. [Figure 11] The inspiration came from Vancouver's English Bay and Kitsilano looking down and across to the downtown. Then we thought of creating some smaller bays like False Creek, thereby allowing the water to drain to the ocean and deal with the flooding.

Our preliminary plan developed a series of what we call "character areas" which had been created in Vancouver, actually, for con-

**FIGURE 11**

trolling the downtown. Each of these character areas are devoted to mixed uses. [Figure 12] We decided to save the local trees and use them as a major pedestrian green spine in the core. There's also an existing village, and the villagers always walked from the village to the sea. So why not save the village, rather than bulldoze it and allow the villagers to grow the market vegetables for this future city. And instead of moving out all the fishermen, develop a fishing market so that they can come in and, like Granville Island Market, sell their catch. Vancouverites all love our fireworks in English Bay, so we had the idea of a really large water body or inner basin that acts as an amphitheatre for large celebrations. The outer tip would be

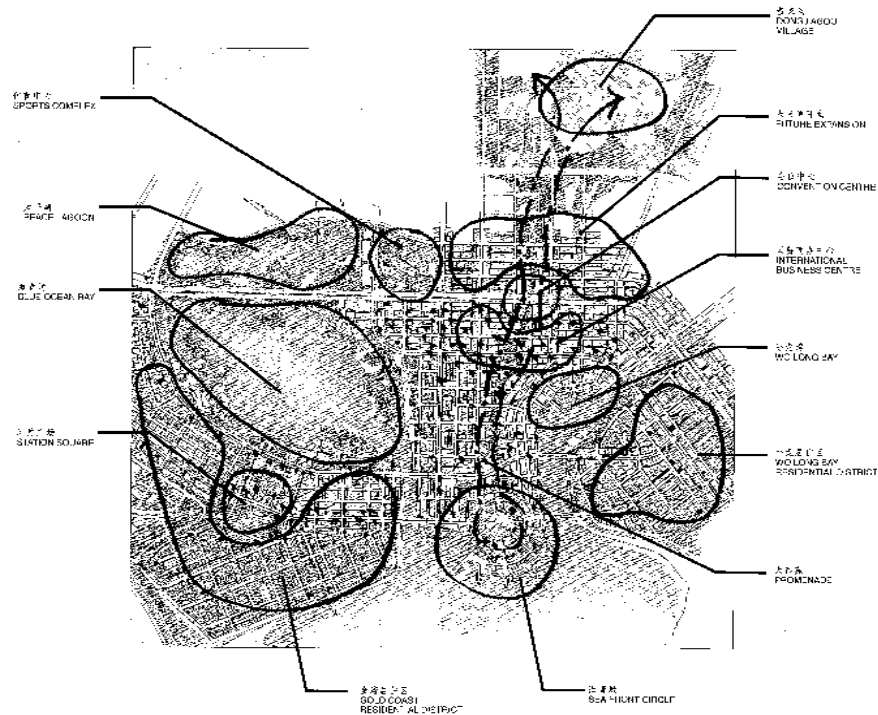


FIGURE 12

used mostly for government buildings, cruise ship terminals, and ocean viewing towers on the water's edge.

We considered the design of the spine and thought that we could take it right through the city, but in a less formal way. The spine then becomes, if you like, a version of the Spanish Ramblas, but maybe like Stanley Park, except stretched out so form is more natural. One bay would be ringed with cultural buildings such as museums, galleries, and planetariums. The idea is a totally public park with no private buildings taking over the water's edge. And then, most important of all, working with John Readshaw at Sandwell Engineering, we addressed the problem of how to flush the inner bays with tidal water. [Figure 13] We have to give John the credit for this, because he said, "Let's work with nature. If we narrow the channel, we can then build the tidal walls at an 8 foot height instead

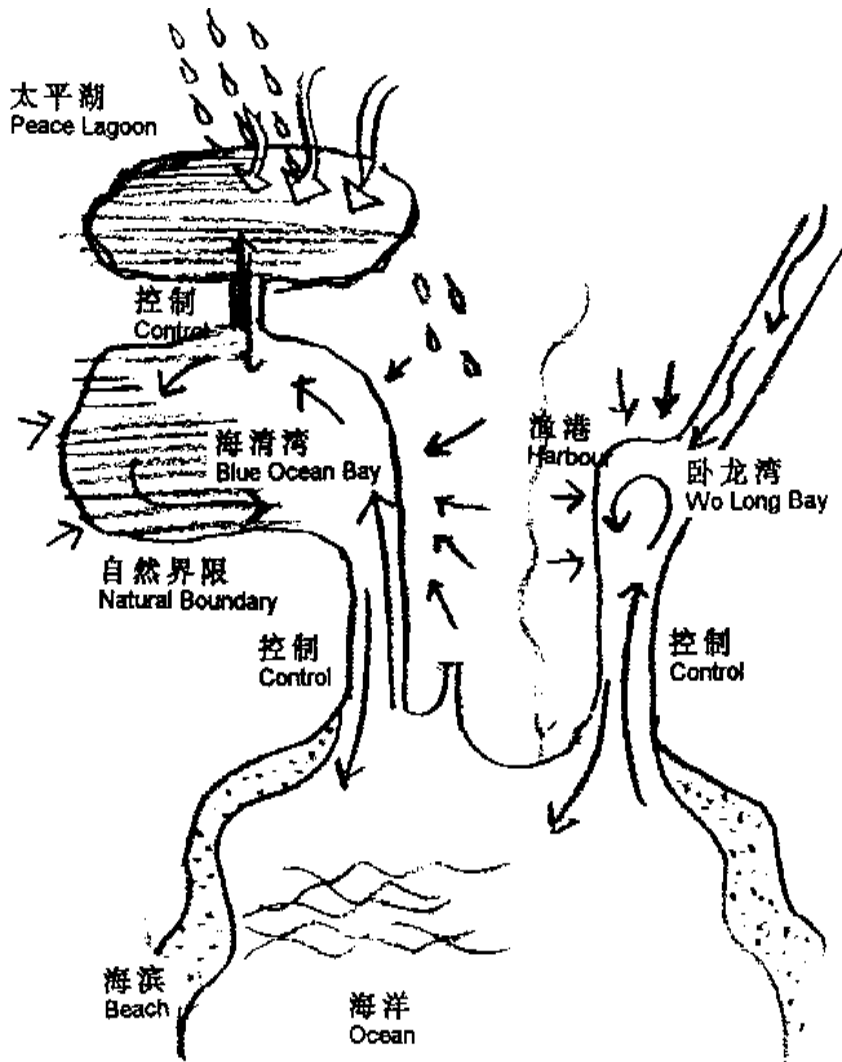


FIGURE 13

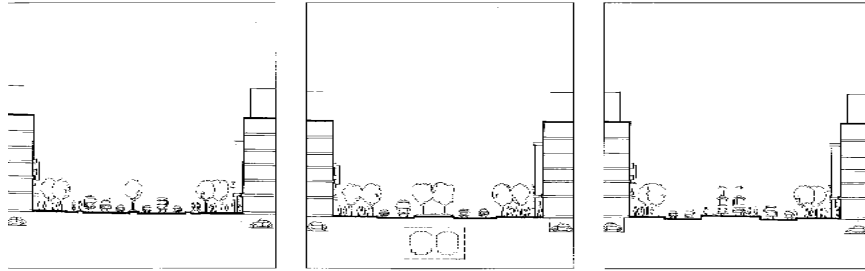
of 16 feet. They can be half the height because like a bottle with a narrow neck, if you turn the bottle upside-down, it takes a certain amount of time for the bottle to empty; but if halfway through, you can turn the bottle back up, you can fill it again. So you're not getting a 16-foot tidal change." The idea is to flush the inner bay and yet still save a lot of money on the seawall. The fishermen can then

take their boats in as well. So really, we won the competition in part because we saved a lot of money on the building of seawalls. If they were to build the linear city as originally planned, there would be miles and miles of 16-foot high seawall.

Then, instead of having a sandwich with typical strip-planing with industry and housing, we created a series of concentric rings and used the bay as a way of forcing the city to grow in the middle rather than sprawling. We also wanted to ensure that the building heights were lower than the surrounding hills. One of the great things about Vancouver is that you go across Granville Street Bridge and you discover downtown; or when you're coming from the University and you come down Spanish Banks there's the city; so we also wanted to use the idea of a surprise unfolding of views.

In our plan, [Figure 12] the parkway runs through the centre, some of the canals are kept on the salt farms, a train station links to a series of ferry terminals, and there are a lot of roadways on axis with the hills so that when you're on the hills you can always look through the city and see the ocean. We also had to site most of the buildings away from the prevailing winds because this port is going to be four times larger than the port of Vancouver. It's going to have bulk exports of wheat and all kinds of other commodities. We have to be careful that the wind does not drive the pollutants to the city.

Then we compared the grains of the various cities that we've talked about with the grain of the city that we are trying to design, because we wanted to make sure that it was not out of scale. We actually picked a typical Vancouver block. Vancouver is one of the few cities in North America with lanes, and these lanes take a lot of the service traffic off the main streets. We also thought that the lanes later on, if required, could be converted to bicycle ways or pedestrian ways, so it gave us an extra module to work on in terms of scale. With Paul Bunt, traffic engineer in Vancouver, we used a series of computer simulations to see what bottlenecks might develop with the grid-networks we had planned. Then we started to lay out some of the streets. We came back to pretty well a Vancouver scale of street widths, and then we asked, "OK, what if we're wrong? What can you do with these streets?" We produced a series

**FIGURE 14**

of diagrams assuming that we're going to accept this typical width. You can see from Figure 14 showing various roads, that if you didn't have tramways in the middle of the street, one would then have bicycle ways and could then have three lanes of traffic with greenery in the middle and wider sidewalks. Alternatively, you could have light or heavy rapid transit and then have your boulevards wider in the centre, with wider sidewalks and two lanes of traffic. In addition to that, we also said to them, "If you leave the road and not fill them more than you have to, you can just build concrete culverts before you fill, and you could do all your servicing under the street without digging the street up every time like we do in Vancouver." They have this tremendous asset that they didn't see before; they saw the filling as a necessity. And finally, we talked about district cooling and heating, segmenting the heating into different zones, and the whole idea of breaking down sewage treatment into smaller packages.

In conclusion, Figures 15 and 16 show renderings of the city and some of the vistas. We won the competition because we always took them to Vancouver. We said, "See how beautiful it is? You could have a city just like Vancouver."

FIGURE 15



International Business Centre



Sports Complex



Peace Lagoon



Blue Ocean Bay



Wo Long Bay Residential District



Wo Long Bay



Sea Front Circle



Promenade



FIGURE 16