

Dunedin Chinese Garden – East meet West



This paper is about the design and construction of the garden and how some of the differences between how things are done in Shanghai and in New Zealand were resolved and accommodated in the garden construction.

Also some of the things which had to be done to maintain the authenticity of the garden, both as to form and appearance, as well as highlighting some of the challenges which in the end were overcome by finding pragmatic solutions and the great deal of goodwill which was present both in the community and in the authorities we had to deal with.

Authenticity of the Garden.



While the initial design concept for the Garden was prepared by Bruce Young, an Auckland Architect, as part of the original Planning Application it was felt that if the Garden was to be an authentic one it should be designed in China by Chinese with expertise in traditional Chinese Garden design using materials sourced from China and be built using traditional Chinese methods by artisans skilled in those techniques. Through the relationship built up with the Shanghai Museum and Professor Tan Yufeng in particular, such a designer was identified in Dr Cao Yongkang and the detailed design of the garden is essentially his work. The Chinese design was for the above ground work while the below ground work and services etc would be provided by local people.

Authenticity was so important not only to the Chinese Gardens Trust but also the Shanghai Museum that a requirement in the Contract with the builders of the Garden, The Shanghai Construction and Decoration Company, was that the construction be authenticated on completion by someone appointed by the Shanghai Museum. Dr Cao, who is now a Professor at a University in Shanghai was appointed by them and certified that the Garden was an authentic one in May 2008.

The Design and Construction Team

Octa Associates were the Project Managers. They appointed a Design Manager who was responsible for arranging the design and construction of the Dunedin work, resource and building consents, managing the interface between the Dunedin and Chinese works, and facilitating the Chinese component so that it was designed and built to a standard which would be acceptable to the local authority. John Beekhuis of Hadley and Robinson was the structural and civil works designer, Murray Petrie was responsible for the water design, McLeod and Associates provided the electrical supply design and worked with the Chinese to install fittings, and Lloyd Reddington provided Quantity Surveying services, while planting expertise and liaison was provided by Mick Field.

It was recognised early on that the design and construction of the garden would need to be a partnership between all parties and that the Dunedin Contractors would need to be involved right from the start if the best result was to be achieved. The challenges of a language barrier, different work methods and materials, the potential conflicts between authentic design elements and building codes, and health and Safety would be more easily addressed if all parties understood what was needed from the start and solutions were developed together. Consequently a process to select the Dunedin contractor was started in late 2005 and Amalgamated Builders Limited was selected from five applicants.

They were involved from that date, including visiting Shanghai as part of the design process to sort out construction methodology and on-site requirements, and their skills and personnel, in particular their Foreman, Warren McEwan, were an important part in ensuring that construction proceeded smoothly and with few hassles.

Design Philosophy



Classical Chinese Garden design, which seeks to recreate landscapes in miniature, is nowhere better illustrated than in the gardens in Suzhou south of Shanghai and four of them in particular which are recognised as masterpieces of the genre were inscribed in the World Heritage List in 1997. Created between the 16th and 18th centuries, when classical Chinese landscape design was at its height, the Suzhou Gardens recreate nature in miniature to celebrate the harmony between heaven and earth, which is a salient feature of Chinese philosophy.

They are actually man-made landscapes where the features of the natural landscape have been replicated in miniature on flat ground. Private literati gardens were traditionally seen by members of the scholarly elite of the time as places of escape from society and politics.

Particular care was taken in the design, the concept of which had to be developed before it was built, to retain design and features which were traditional to gardens in this area of China. Gardens were normally adjuncts to the living area and contained a building where the scholar could read, write and do calligraphy, a dining hall where he could entertain guests, a building where he could entertain small groups, an entrance together with covered walkways connecting them. The whole gives the feeling of being larger than the almost 2500 m² area on which it is located. (The area of the Garden within the external walls is 2,483 m² – with the entrance courtyard added the area is 3,695 m²)

The garden are a blending of water, rock, plants, structures, and sky with ever-changing views as one moves around and through it. Pathway, corridors and enclosed spaces are structured to emphasise both openness and enclosure – and to provide sudden exposure to a new view.

But rock gardens are the soul of Suzhou. The stones of which they are made – the soul's receptacle - come from Lake Tai, which is located near Suzhou. Worn down by travel down rivers and erosion and deposited in a lake which has now been uplifted, these rocks were so famous that over the centuries emperors from the distant north part of China sent their builders to bring them back to decorate their gardens. The assessment of their quality is based on three criteria. They must be slender rather than bulky, they must contain horizontal as well as vertical tunnels and their surface must be wrinkled rather than smooth.



The most famous and precious among them are called “rock peaks” and many are mounted in the gardens of Suzhou as special features on their own. A number of rock sculptures have been provided around the Dunedin Garden – with no particular concept in mind – simply what you see yourself is what is within you.

The “Garden of the Master of Nets” is one of the four gardens listed in the World Heritage list and is built on the site of a 12th century residence which was remodelled in the 18th century. The Dunedin garden design is based on this garden because of its comparable size, the fact that it is constructed around a lake, and to some extent its location. By their very nature Chinese

Gardens are enclosed and provide an oasis of tranquillity and quietness within a busy precinct giving the opportunity for contemplation and reflection. A Chinese garden is more than just a physical place – it is an experience.

The Rock

You can't say that something is authentic if you use some of the key materials from a local source even if they are of a very similar chemical composition. This is particularly so if the material is the rock which forms such an integral part of Chinese gardens and by tradition contains the very soul of it. So there is no apology for using the rock from Shanghai.

Given the three criteria above for the rock used – it must be slender rather than bulky, it must contain horizontal as well as vertical tunnels and the surface must be wrinkled rather than smooth – it is hard to see how the classification of “female rock” can be applied. However the overall impression is one of roundness with many holes and crevices and not of jagged edges. Male rocks on the other hand are rough with many sharp edges – and are generally columnar in form. There are good examples in the garden.



Approximately 1000 tonnes of rock were transported from the quarry at Lake Tai coming in over in 50 containers. Over 2/3rd of the rock was used to create the artificial hill the design of which is very much in the mind of the particular artisan who has the expertise in the design of such features The balance of the rock was used to line the edges of the pond and to create the rock features in various parts of the garden.

The Fish

Fish in the pond are an important element of the garden design – they breathe life into the garden. Providing an environment in which they can thrive is important. Equally the colouring of the pond water to a green colour is important since this colour is believed by the Chinese to bring good fortune. A high level of treatment is not required since the green colour is actually caused by an algae and a high level of water treatment would be detrimental to establishing this environment.

There are approximately 350 goldfish in the pond, supplied through the Pet Warehouse. Carp, which are the fish used to stock ponds in China, are banned in New Zealand.

Boundary between the above and below ground Construction

The Dunedin based contractor was responsible for the construction of foundations and services below ground level and the Shanghai Construction and Decoration Company for everything above ground level.



The boundary between the two was defined by a single solid black line on the plans supplied by the Chinese designer and this resulted in some judgement having to be exercised by the Dunedin designers as they prepared the design for the foundations. However these were resolved at the various meetings held and in the end very few alterations to the foundations were required after the Chinese artisans arrived to start the above ground construction.

Pond Design

The original design from Shanghai called for a pond having a maximum depth of around 1.75 m. However the Garden is built on reclaimed land and the site investigation carried out prior to design and construction of the foundations identified three issues:

- Firstly the water table was generally 2m below ground level
- Secondly the ground above the water table would not hold Water, and
- Thirdly there was a need to separate the fresh water in the pond from the saltwater in the groundwater.



Retention of the water in the pond and separation of the pond water and groundwater is provided by way of a geosynthetic membrane (essentially a layer of bentonite retained between two synthetic fabric layers) which is protected by layers of specially selected gravel above and below the membrane and which is laid under the whole of the garden. It is “self-healing” by which is meant that if it is penetrated in any way it will quickly seal again owing to the presence of the bentonite.

Since we did not want to excavate below the water table the maximum depth available for the pond was 1.35m. Essentially there needs to be an area with a greater depth of water which provides a cooler environment for the fish on warmer days and the Chinese designer was happy with what has been provided.

Fencing of the Pond

The design of the garden called for the construction of a pond. Under the DCC Bylaws, and indeed NZ legislation, any body of water which is more than 600mm deep is required to be fenced. Given that the whole of the pond is enclosed by high walls and the fact that a fence around the pond would be detrimental to the authenticity of the Garden the DCC waived the requirement to fence the pond.

Hill and East Wall Construction

An artificial hill over 6m in height, contained by a high wall over 8m in height at its highest point on the eastern boundary and adjacent to the Main Trunk Railway shown in the design from the Chinese designer was identified as a potential problem.



Since they were to be built on reclaimed land over a former estuary there was concern about the effect of settlement on both the hill, the wall, and the railway line as well as the potential to affect the pond. Various options were considered, including piling under the whole area, but in the end it

was decided to preload the area by placing fill over the area to a height of over 6m and letting it settle for a period of time before the wall in particular was built. Over a period of two months the artificial hill settled in excess of 300mm to the stage where none was occurring. At that point construction of the east wall commenced and to date apart from some anticipated minor cracking the solution appears to have been a good one. The artificial fill was retained and formed the base of the rock hill created by the Chinese and which is such a feature of the garden.

Design and Construction of the Artificial Rock Feature



We provided the compacted metal hill and a digger and driver to assist the Construction Company build the artificial rock hill, which

is in reality a stone facing to the granular hill created to provide the pre-load of the area. The digger and driver assisted the artisan, whose responsibility construction of the rock facing was, with lifting and placement of the rock. The hill design was very much in the mind of one man – Mr Gu who worked with 2 3 others to build it in about six weeks.



supported in position using a variety of timber
position using galvanised reinforcing bars grouted
to concrete poured at the rear of the stonework.

is a rock sculpture and falling from just below the
water is pumped from the main pond up to the top
of the hill and falls back in to the pond.

Buildings – General

What was to be built was authentic Chinese garden structures not an office block or a habitable dwelling. Some requirements of the NZ Building Code were simply not appropriate e.g. elements of water-tightness, insulation and even the form of construction. However earthquake resistance and the life of the structures were two elements which had to be addressed in order to obtain Building consent. Other aspects could be covered by inspection and certification by a suitably qualified person that what was being provided was simply an alternative design solution.

Earthquake Resistance

Many buildings using a similar form of construction have survived for centuries in China without damage in events similar to those likely to be experienced in New Zealand.



The extensive timber frameworks in the structures are very flexible and absorb the energy in an earthquake by deflection within the framework. All the jointing is by mortar and tenon with wedges so the whole is intimately bound together. The base of the timber columns are held in position by the walls

within which the columns sit and so are unlikely to move off the foundation slabs. The whole is very earthquake resistance structure which will suffer minimal damage in an earthquake. The tile roofs may suffer some damage but this will be easily repairable should it occur.

Life of Timber Structures

Many buildings using a similar form of construction have survived for centuries in China without damage in events similar to those likely to be experienced in New Zealand.

The timber used in the construction of the garden is Chinese fir and all the jointing has been effected using mortar and tenon joints with wedges so the whole are bound together without the use of fixings such as nails or other corrodible items.

The timber itself is protected by a seven coat lacquer system which provides protection against bacterial and insect decay as well as providing a long life protective coating. Based on the sap of trees the lacquer is applied in seven layers.

In the case of the columns within the second and third and fourth and fifth coatings layers of fabric are wrapped around the columns and this provides additional protection as well helping to create the smooth surface finish of the columns and prevent the timbers from splitting.

It is anticipated that the lacquer coating will last for five year in places exposed to direct sun before they will need to be relacquered and in those places not exposed to the sun 10 – 12 years.



All of the columns are supported on hand carved granite plinths which in turn sit on the granite slabs forming the floor. It is thought that the granite plinths were installed in the past when it was found that timber placed directly on the ground rotted. Providing some separation from the ground resolved this.

The Building of the Structures

Timber for the structures was purchased by the Construction Company some months before it was required in order that it season and dry out before being worked on. A large building was obtained in Suzhou and all the structures were assembled there, including the doors, windows and latticework.



All of the structures were built in the warehouse, dismantled and prepared with the initial coatings of lacquer, and then reassembled in the warehouse.

While plans had been supplied by the designer it was considered prudent to require that the work in China be physically inspected and checked before it was dismantled and shipped to Dunedin. We needed to be sure that what was being built by the Construction Company would fit onto the foundations being built in Dunedin. The inspection took place and no discrepancies were observed. The structures were then dismantled again and shipped, in containers to Dunedin.

Erection of the structures in Dunedin was the third time that it had been done and no problems were encountered. No nails were used in the main structures and all fitted together well and tightly.

The Roofs

The roofs of all structures are of earthenware tiles, all hand made and all supplied from Shanghai. There are approximately 400,000 of them.



The method of laying the tiles followed traditional tiling techniques from China and they were placed by artisans with special skills in this field of work. The curve of the rooves is traditional and each tile is overlaid by the next one by 80%. The sweeping corner ridges on each structure were created by one particular artisan who was also responsible for the

design of the traditional motifs on each end wall. All of the roofs were painted with two coats of black paint.

The Drip Tiles

Under the NZ Building Code water from roofs is to be collected into gutters and led to a disposal point which is normally the Stormwater sewer. Traditional Chinese garden design has the water running of the roof and falling directly to the ground. The control of the water direction is by way of drip tiles located at the end of each channel on the roof which ensures that the water falls to the ground and does not run down the walls.



The end tiles are a specific design for the Dunedin Garden and are all handmade. The flower symbol in the face of the tile indicates that it is a public garden.

Where the drips landed on sealed surfaces such as surfaces were graded towards sumps the tops of which are of a traditional Chinese pattern and which were brought from Shanghai by the Construction Company.

Windows and Doors

The windows and doors all follow traditional Chinese design and the particular patterns have been passed down over the centuries. All were fabricated in Shanghai, given their preliminary coatings of lacquer and then shipped to Dunedin. Once installed in the Garden in Dunedin the final coatings of lacquer were applied “in situ”. Great care was taken by the artisans when applying the lacquer as it is very aggressive and wearing gloves was essential.

The hinging of doors and windows is all traditional being timber shafts at either end of the window or door vertical which fit into holes created for them. Similarly the window catches are all of traditional Chinese design.

The latticework is particularly intricate and it is thought that it was originally created to provide support for skins or the like used to cover the windows to reduce draughts and rain entering the buildings. The glass installed, while not traditional, is a practical measure to improve the environment within each building and follows similar installation at many of the present gardens in China. The quality of the glass at the various locations complies with the NZ Building Code.

Walls construction

Enclosure of the garden within a wall is a characteristic of Chinese Gardens. In our case the walls vary in height from 3.5m in height to over 8m.

The walls are all constructed of light weight concrete in order to reduce the load on the ground from them and reduce the earthquake load. The lightweight concrete blocks being imported from Shanghai. The external block walls, in fact all walls both external and internal, were plastered and then painted. The white paint was also brought from Shanghai but we have been advised that any future maintenance can be done using any quality white acrylic paint.

Under the NZ Building Code the walls were required to be reinforced with steel rods in both directions. Walls were constructed in three lifts to enable them to be built by artisans from scaffolding without undue or awkward lifting. Initial bars, approx 3m in length were epoxied into the concrete foundations, drilled blocks were threaded over the vertical bars and wall laid up to about 2 m in height. The vertical bars were then grouted in, horizontal bars laid in a pre-cut vee along the top of the lift and grouted in position. The

next reinforcing lift was connected to the original bar by connector, and the next lift of blocks placed as for the first lift

Low walls are of brick construction with two plaster layers applied to provide the finish and a suitable surface for painting. They were built after all pedestals and columns were in place so they effectively anchor them in position.

Balustrades and fall heights

The original design from China included low balustrades along many of the corridors adjacent to the pond. The balustrades are a feature of gardens in China and retention them in the dimensions originally proposed was important to the designers. However under the NZ Building Code where a fall of more than 1m can occur, people must be prevented from doing so by the provision of a 1m high barrier.

It was impractical to raise the height of the balustrades in many locations, and to do so would have resulted in a barrier which was not in keeping with the need to retain authenticity.



The solution arrived at was to restrict the depth of the pond to 300mm in areas adjacent to where the balustrades was installed – in fact the whole of the pond has a ledge with 300 mm depth of water and 1m wide around its perimeter.

Fall heights at other locations, such as the first floor balcony and the walkway on the eastern side of the garden, are protected by barriers which are 1m in height.



Low walls topped with a ceramic slab and a vertically curved timber balustrade provides seating in some areas (such as the pavilion in the pond, around the Main Hall exterior corridor and in the Entrance Hall). Such curved seating is known as the “slumbering woman” seating.

Access for the Disabled

Access for the disabled must be provided under the New Zealand Building Code. In addition those with disabilities prefer to enter through the front entrance and not through a special entrance which may be away from the main entrance.

The initial Chinese design from Shanghai included steps and narrow corridors around the garden. The width of the corridors was dictated by the need to retain the traditional proportions of the buildings. They also preferred to have no ramp at the main entrance since stepping up and over water is traditional and culturally important.

We were able persuade the Chinese designer to change the design and install ramps inside the garden and also increase the width of the corridors to meet the NZ standards for all except three places – over the hill on the eastern side, at the main entrance and at western entrance to the Side Hall.



However we did reach agreement with the designer that ramps could be placed at the main entrance and at the western steps to the Side Hall, on the understanding that such ramps were regarded as temporary and that it is still possible to see the original steps.

Access around seventy-five percent of the garden can now gained by someone in a wheelchair or on a frame.

Floor Beams in Doorways

Each of the buildings has a beam on the floor in the doorway as is traditional in Chinese culture – the height of the beam being an indication of the status of the owner.

The placing of the beams in the doorways to buildings provides a barrier to the free movement around the garden for those with disabilities and wheelchairs in particular.



The solution which was acceptable to the Chinese was to provide removal sections which can be removed under normal operations but which can be put back in place for formal and/or ceremonial occasions.

Pai Lou

The Pai Lou, or entrance, is an integral part of Chinese Gardens in China and one was always intended for the Dunedin Garden. Unfortunately at the time funding became available to start construction of the garden itself funding was not available for the Pai Lou and so it was not included in the initial scope of work to be built. Subsequently when the designer, representatives of the Shanghai Museum and representatives of the Shanghai

Construction and Decoration Company came to inspect progress on the garden in November 2007 they were strongly of the view that the Pai Lou needed to be built since it was such an integral part of the whole. As a result the price of construction of the Pai Lou was severely discounted on their part and with a significant donation from a supporter of the Garden the Trust was in a position to commission the construction of the Pai Lou.

Consents were obtained and the foundation constructed in January 2008 essentially comprised four pods below ground level into which the columns supplied from China would be placed and grouted in.

The Chinese artisans returned to China in December 2007, with the main garden substantially completed apart from some finishing work. This also allowed them to have the Chinese New Year at home as well as allowing time for the Construction Company to source the materials, prefabricate the Pai Lou and ship all to New Zealand in February 2008.

Construction of the Pai Lou started in April 2008 and was completed in May.



The four granite columns, which support the structure and are on average 5-6 m long, were all excavated as four whole single columns something which is unusual today. The form follows traditional Chinese design with the sweep of the ridges matching those in the buildings with the Garden and which are very much the signature of an individual artisan.

The colours of the Pai Lou reflect those which were popular in the period gardens similar to the Dunedin Garden were built in China.

Lighting

There are over 380 lights in the garden including the traditional corridor overhead lights, corridor floor lights, garden lights, up-lights on the Pai Lou and other feature lighting. The height of the water table posed some problems for the design of the underground wiring but for the large part all wiring is unobtrusive and cannot be easily seen.

The light fittings were supplied from China.

The construction Company brought their own electrician but he was not conversant with New Zealand wiring Regulation nor was registered in New

Zealand. Consequently, while he could wire up most of the overhead lighting and switches, his work had to be overseen by a registered NZ electrician in order that the whole could be signed off.

Planting

Planting plans were received from the Chinese designer generally showing the larger plants and trees on one plan and the lower ground cover type plant on the other. Review of the plans indicated that about of 90% of those selected would be suitable for planting in a garden in Dunedin. Substitutes were identified and agreed to by the designers. All are indigenous to China but were able to be sourced in New Zealand.

Generally the pine, bamboo and flowering blossom trees are basic to any traditional Chinese Garden and such is the case in the Dunedin Garden. In addition there is preference for having areas of similar plants rather than rows or lines of plants and this pattern has been followed and will be built on over time.

The form and size of the larger trees will be monitored and manicured so that both are fitting for the environment and scale of the garden. With this in mind a relationship is being established with the Yuyuan Garden in Shanghai so that their staff can come and advise on what to do at the appropriate time.

Height of Water Table and Planting

Because the whole of the garden is enclosed in a waterproof layer the watertable is very high and this posed some design issues for the plants at the lower levels which affected the selection of the plant types For the larger trees they were placed in their own water proofed containers.

Rooflines of adjacent buildings

The Zig Zag of the Settlers Museum roof is of concern to the Chinese since it looks like a dragon and is not a favoured profile. In addition the roof line of the buildings on the East side is untidy, as indeed is the building itself, and provides a poor backdrop to the garden. Both can be seen from within the garden when looking outwards.



The Settlers roof is to be masked by tall trees planted in the corridor between the garden and the Museum and these were planted at the time the garden itself was completed. We were fortunate that

the Dunedin City Council were able to locate some big trees (at Lockwood Avenue) which needed to be moved and consequently the Settlers roofline is likely to be screened sooner rather than later.

The rock feature and high wall on the east side of the garden essentially mask the building on the east side.

Water Quality and the Environment for Fish

Many of the gardens in China are located near springs and these feed the ponds and help maintain the water quality which is suitable for the fishlife.

Such is not the case in the Dunedin garden and a recirculating water system has been installed. Water enters the garden from eight points around the garden, generally located towards the southern end and in the islets, and flows towards an outlet on the plaza at the south end of the Side Hall. From here it passes through screens to remove detritus from the water, has air bubbled through it to increase the oxygen level of the water and then is pumped to the eight outlets to the pond. The water can be recirculated either once every day or once every two days.

High levels of water treatment were originally considered but ruled out on the basis of cost. Subsequently we were advised that with the need to maintain a green algae in the water and hence provide the green murky colour required the level of treatment is not required to be high. However control of the feed to the fish and removal of decaying leaves etc on a regular basis will be essential to maintain the right environment.

If too much water enters the garden during rain the excess water passes over an overflow to the foul sewer.

The moat at the front of the garden is another part of the garden which reflects the importance of such features at gardens in China. The stepping over water when entering the garden is culturally important and hence its inclusion in the Dunedin garden. The water in the moat is only indirectly connected to the main pond (through movement of ground water) and has its own water supply. The separation was made so as to avoid the possibility of the pond water itself being contaminated through vandalism.

Ornamental Courtyards, motifs and paths



There are number of ornamental courtyards and paths within the garden – all of traditional

Chinese design. Each stone came from Shanghai and was placed by hand.

The entrance courtyard, which was laid at the same time as the Pai Lou was constructed, is all of granite from China

The corridor paths are all laid in a herringbone pattern with earthenware handmade tiles– a feature of the traditional gardens in China.

The lattice windows, whether in timber or concrete, are all traditional Chinese patterns and there are a wide range of them in the garden.

A number of the individual areas within the garden have been specifically laid out and named.

The two lions at the entrance to the garden were sculpted by hand from granite and gifted to the Dunedin Chinese Gardens Trust by the Municipal Government of Shanghai.

Naming of Rooms



All the rooms and areas have been named by the designers using traditional Chinese characters and calligraphy. The interpretation of these can vary but that for each room has been agreed for the Dunedin garden.



Similarly couplets (the green coloured calligraphy on boards adjacent to the four main rooms have a traditional interpretation. For example that for the Main Hall has the literal meaning:

“ Snow wine springs out of the bottle. Like the flowing sunlight. The fragrance of the hotbed chives floats above the morning dews.”

The names of each major room, and indeed the Garden itself on the Pai Lou, are displayed in gold leaf on blackboards. These boards were all prepared in Dunedin by the artisans and were one of the last items to be placed.

Furniture

Furniture based on Ming Dynasty designs was made in Shanghai and shipped to Dunedin. They have been made from rosewood. While the garden

at present is largely devoid of other decorations these will be provided over time as the pieces and best locations for them are identified.

Archaeological Issues

The Dunedin Chinese Gardens Trust commissioned an archaeological report on the site in the late 1990's. While it did not identify any extensive issues it did suggest that remnants of the old Rattray Street wharf may be found under the site. At that time the Garden was envisaged as covering a much larger area with restaurants and retail shops outside the garden itself but these outside activities were deleted at the time the original planning application was made.

On the day excavation started on site a member of the public contacted NZHPT who placed a stop excavation notice on the site. The obtaining of a heritage excavation consent had been overlooked and a ten day delay occurred as the issue was sorted out (ten days being a statutory requirement). The outcome was the requirement that an approved archaeologist be present on site at all times when excavation was taking place and that the whole be recorded.

What was found was the remnants of a railway platform which had been over the tracks from the Settlers Museum, timber foundations of a shed at the NE corner, a number of unbroken bottles (similar to many held already) and an old Chinese cap.

Importing of Materials

All materials for the garden above the ground, except cement, sand and topsoil were imported from Shanghai. Through close liaison with Ministry of Agriculture the criteria for import of items were defined well before anything was to leave China.

All items had to be fumigated and the containers sealed before leaving Shanghai. Rock had to be washed, steam cleaned and fumigated to a specific formula and sealed up in its containers before being shipped from China. All containers were inspected on arrival and were required to be unloaded on a sealed area.

The finding of soil and vegetation on some rock in one container caused some consternation at the time but overall the entry of the items into NZ went very smoothly.

Chinese Artisans

Some 40 workmen from Shanghai came to build the initial stage of the Garden, a mixture of artisans, workers and support staff including two cooks and two administration staff.

In order for them to gain entry to New Zealand a specific invitation was required and this was issued by the Chairman of the Trust, Mayor Peter Chin. It was required that we demonstrate that the artisans had skills which could not be duplicated in NZ or were support staff that were necessary for the functioning of the group as a whole.

The workers were paid at least the minimum NZ wage.

A further contingent of 13 artisans arrived in March 2008 to build the Pai Lou, finish the garden and lay the courtyard outside the main entrance.

Hosting the Shanghai Workers

Language was initially thought might be a problem but in the end most communication between the designers, Construction Company and those from Dunedin was not. Dr Cao spoke reasonable English and could read it well. The Construction Company Project Manager could speak a little English (which improved as the work progressed) but could read it somewhat, while the Administration assistant who worked with the Project Manager could speak English reasonably well and could certainly read and interpret it. For the formal meetings and at all site meetings during construction an interpreter was employed.

None of the artisans spoke English (all spoke a Shanghai version of Mandarin) but through a combination of English, gestures and demonstrations on site most messages got through.

The artisans were accommodated in a Backpackers establishment 2 minutes from the Garden. They were the only residents during the period of construction. All meals were provided by the Construction Company and they brought two cooks with them. Arrangements were made with local suppliers for provisioning and others provided gifts of fresh meat, fish and vegetables. In fact the movement of the artisans to and from the site became quite a feature of their time in Dunedin – particularly as they initially did not have a great regard for the traffic lights!

The Chinese Gardens Trust and Chinese Association hosted the artisans from time to time and arrangements were made for them to go on the Monarch, Taieri Gorge Train and to Moana Pool.

The normal working day was from 7.30 am to 5.00 pm with an hour taken for lunch which was provided at the Backpackers. No breaks for Morning or afternoon tea were taken. They worked seven days a week and had one day off each month.

Supply of Local Construction Materials for Work done by the Shanghai Construction and Decoration Company

A condition of the contract with ABL was that they provide the liaison between the Chinese contractors and the local suppliers. ABL used their own network and systems to monitor and control the purchases and the system worked well.

Health and Safety

The ways of working in Shanghai on building sites is quite different from that in New Zealand and having the Chinese artisans meet the NZ Health and Safety requirements was seen from the beginning as one of the biggest challenges for the project.

Close liaison with Department of Labour as to their requirements and involvement of ABL from the start were key activities in setting up the processes at the site. ABL were primarily responsible for Health and Safety on the site for the duration of the projects – it was their site and they were responsible for what happened on it.

The Construction Company were advised of what the requirements would be at a number of meetings both in Shanghai and Dunedin when they visited. Briefings for all the Chinese artisans were conducted when they arrived in Dunedin and before they started work on the site. ABL ensured that the Construction Company set up their own H &S structure on site with whom ABL dealt.

Hazard Boards were posted at the site in both Chinese and English. During construction the areas of particular concern were:

- the way scaffolding was used and abused
- use of eye, ear and breathing protection when cutting granite, bricks etc,
- looking after and using equipment properly,
- site tidiness, and
- the wearing of safety footwear.

The ABL foreman, Warren McEwan, had a unique way of getting the message across - a mixture of a loud voice, facial expressions, gestures and demonstration. No serious accidents occurred on site during the construction period.

It was not until the second last day of the project that the Labour Department found something so wrong that they stopped work, albeit briefly, until it was rectified – it is just as well that they were not on site all the time.

The Cost of the Garden

Overall Cost	
New Zealand Component	
Chinese Component	
Addition of Pai Lou and granite courtyard	
Furniture	
	\$7,750,000
How the Cost was met	
Cornerstone Contributors	
Government	\$3,750,000
Dunedin City Council	\$1,000,000
Community Trust of Otago	\$1,000,000
Chinese Donors ¹	\$425,000
Other Contributors	\$1,500,000
Poll Tax Trust ²	\$100,000

1) There are approximately 1000 Chinese families in Dunedin.

2) A Poll tax was imposed on emigrating Chinese by the Government in 1881 and discontinued in 1944. The Chinese Poll Tax Heritage Trust is the mechanism established to recompense the Chinese community for the injustice of the Poll Tax and it assists with funding for projects that recognise the contribution that the Chinese have made to the community. For the Dunedin Garden the contribution was towards the construction of the courtyard. There is a plaque acknowledging the contribution adjacent to the accessway between the Garden and the Settlers Museum.

The Project was completed within the original budget in spite of the addition of Pai Lou

Recognition of Contributions

Contributions to the cost of building the garden are acknowledged on donor boards which are of granite supplied from Shanghai. Engraving was initially done in Shanghai but additional names were added in Dunedin by Dunedin Monumental Masons Ltd.

Management of the Garden



The Dunedin Chinese Gardens Trust built the garden and gifted it to the Dunedin City Council. They will have an on-going overview role through membership of the Dunedin Chinese Garden Governance Committee.

The Dunedin City Council now own and manages the operation of the garden. It was formally handed over in September 2008.

Maintenance is carried out by the DCC and their contractors and garden maintenance by DELTA.

W J Henderson
Design Manager

10 March 2009