

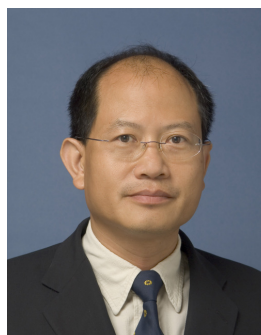
Choi Hei Road Park - a community park converted from an abandoned quarry

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Background

The granite plutonic located at the central part of Kowloon Peninsula, Hong Kong, China, constitutes the famous Anderson Road Granite Quarry. Since the early 20th century granite stones were excavated from this site for local building materials and constructions works in the city and the surrounding Pearl River Delta areas.

In 1990's, after years of production, the granite quarry ceased production and was largely abandoned. There was a series of discussions of how to re-use the land for urban development. 1997 is the year Hong Kong returned to China as a Special Administrative Region (re. HKSAR), the urban planning process has to be speeded up to tie in with the upcoming development of Hong Kong in relations to China's overall urban and economic development.

In 2002, a large-scale residential development was implemented, i.e. known as the Choi Wan Road Development and Anderson Road Development. Choi Wan Road Development was the first stage development consists of 17 blocks of public rental housing blocks, car-parks, commercial centres, schools, access road networks and recreation facilities.

Under the urban planning context, one of the challenging tasks is to convert a major piece of man-made cut slope left behind by previous quarry excavations to a community park to serve the neighborhood. This sloping site area, named District Open Space A (DOS A) was designated for this purpose. The landscape design process commenced in 2005 and was implemented on site in 2007, it was later named 'Choi Hei Road Park' by the client, completed in early 2010, and opened to the public in the summer.

Site Development

The Choi Wan Road Development sites were formed by the Civil Engineering and Development Department within the overall Choi Wan Road/Jordan Valley site formation contract which includes site formation works, infrastructure and services, roads, and bridge works. The development plan prepared by Housing Authority allowed for public housing development on excavated platforms with a target population of 50,000.



Fig.1 Choi Wan Road District before excavation



Fig.2 Choi Wan Road District after excavation

The Choi Wan Road Development had involved extensive site formation work that had transformed large extent of the natural hillside and abandoned quarries into building platforms for public housing, schools, and recreational developments.

Choi Hei Road Park is located on a sloping platform between public housing developments with an elongated slope and an overall level difference of 30 m. The northern part of the site was occupied by a 6 m wide drainage reserve for the entire Choi Wan Road development sites.



Fig.3 Choi Hei Road Park

Landscape Design

The design objective was to create a green belt embracing the Choi Wan Road public housing developments surrounding the park, and the provision of the required open spaces facilities for both active and passive recreation.

Design Concept

The design concept was to blend in the open spaces with surrounding public housing estates and to reinstate the environmental quality of ex-quarry site.



Fig.4 Ex-quarry site



Fig.5 Conserve a community park

Much thought was given to enhance the quality of a healthy living; therefore, the elongated site was designed to create a leisure walk trail, integrated with gentle-gradient ramp for barrier-free access and steps for fast circulation. The 30 m level difference of the site was overcome by a system of ramps and a steel bridge, integrated with short steps for fast moving to facilitate different park users.

Sustainability design was integrated into the park elements including history of the quarry site, trees transplanted, solar-power street lamps, green roof, and the conservation of natural granite outcrops and stones were displayed throughout the park to demonstrate its original characters and the new sustainable design elements.

Design Objective

To provide a District Open Space, an environmental-friendly open space, integrated with the external space of the adjoining public rental housing developments, and to form a 'Green Belt' for the community.

Design Process

The main feature was to provide a leisure trial integrated with native plants and conserved geological display with a view to provide education and conservation in addition to recreation. A range of passive recreational facilities were also provided throughout the park for the users of different age groups within the community.

Essential recreational facilities, both passive and active are provided, including sitting out areas, Tai-chi exercise venue, rain/sun shelters, children's play-area, elderly fitness, water feature, and management blocks with public toilets. The disposition of recreational facilities has to take into consideration the pedestrian circulation, with respect to the adjoining shuttle lift towers, footpaths, and residential developments to provide an effective circulation network between the park, surrounding housing blocks, and public transport hubs.



Fig.6 Public toilet and Elderly fitness area



Fig.7 Sitting out area



Fig.8 Tai-chi area with rain/sun shelter



Fig.9 Children's play-area

Exercise areas serve as places for social gathering as well as for morning exercise. Public toilets and sheltered seating were positioned at convenient areas for park users. The theme of granite geology was adopted to make use of the natural conservation for educational purpose.

Large-scale planting of trees and shrubs was carried out along the peripheries of the open spaces for both aesthetic and design purpose. Due to the hostile nature of the quarry site, special plantings techniques had to be used by the project team to overcome the site constraints and to ensure a sustainable long-term landscape maintenance programme.



Fig.10 Trees, shrubs and lawn by turf



Fig.11 Slope greening

The entire process of landscape design for Choi Hei Road Park DOS is to 'conserve a community park from an ex-granite quarry'. The design process was a series of tasks to resolve both technical and physically problems, and the participation of various stakeholders including the community -

- geotechnical considerations
- educational opportunities
- community needs
- conservation issues
- site access.

Site Constraints

The site had inherited a number of site constraints for the design team to resolve and turn it into an urban park to serve a community of 50,000, these constraints had turned into design opportunities for the project team to overcome, and eventually generated some unique characters for the park.

Steep and elongated site, the rocky sloping site had a total site area of 1.36Ha, with a distance of of 270m from the upper platform to the lower platform, and the northern part of the slope is occupied by a 6.0m wide drainage reserve. The 32m level difference between upper and lower platforms had limited the freedom of design and the provision of certain recreation facilities. The site had to be designed as a meandering walking trail no steeper than 1:12 with selected facilities along it. Level changes are minimized in order not to disturb the existing manholes in the drainage reserve previously constructed before the site formation stage. The final design had made use of the meandering path to create viewing stations and platforms for various uses and activities.



Fig.12 Steep and elongated site



Fig.13 Meandering walking trail (gradient 1:12)

Planting in an ex-quarry site, is another challenge. After site formation, the DOS site was largely barren with no vegetation and there was a lack of topsoil layer. The design team had included contract specifications requiring the Contractor to remove top 900mm existing bedrock and debris for those pre-design tree planting locations, backfilled with decomposed granite and soil conditioners for later-stage planting works. This measure enabled the project team to carry out large tree planting for screening and amenity tree plantings at strategic locations. Localized soil mounds were all created for massive tree and shrub plantings for a series of spatial effect to the sloping site.



Fig.14 Gentle gradient ramp integrated with steps



Fig.15 Leisure walk trail (gradient 1:12)

Extensive tree transplant was carried out in Jan 2010, 91 nos. mature trees including *Hibiscus tiliaceus*, *Lagerstroemia speciosa*, and *Crateva religiosa* from another district (Kwun Tong) were brought in from Sports Ground and Swimming Pool which was undergoing re-development. The large-scale tree transplant required good co-ordinations and planning among various parties and contractors. The transplanting works were well executed by the project team and helps to create some 'immediate greening effect' for the ex-quarry site.

Conservation of existing natural granite. Early before the commencement of the construction of Choi Hei Road Park, a land survey was conducted to locate the existing natural granite outcrops, which was part of the heritage of the ex-quarry site. NGOs and local interest groups also offered assistance to identify the history and illustrations of the granite geology for display within the park. The local 'Association for Geoconservation' had given their expertise and advice during the design and construction stage for the display of the geological development and display of rocks within the park, and had contributed much to the education aspect of the site.



Fig.16 Natural granite outcrops shows for educational purpose

Communications between government departments. The project demonstrated a good example of public departments working together under tight programme, from site formation, project scheme design, landscape detail design, public consultation, contract management, and delivery to the client and public.

Discussions

To overcome the steep and elongated constraints of the site, to make it accessible to all, numerous calculations have been made to check out the best route of the leisure walk trial, which has to be maintained in a gentle gradient of 1:12 throughout the entire park.

The dead loading capacity of the cut slope was only 10 KPa, this imposed another limitation of landscape constructions within the site. Therefore, shelters and pavilion structures, and even security fences were all required to be carefully located to comply with statutory requirements and to suit the site conditions. Structural footings have to be constantly modified to reduce their impact on the surrounding slopes.

Planting on granite bedrocks require early planting design with the site constraints to identify localized excavation works for backfilling planting soils. Careful design of sub-soil drainage discharge with a system of sub-soil drains were prepared to ensure the imported topsoil not being washed away during heavy rainfall.

The objective of a sustainable landscape design could be found in various design elements. In Choi Hei Road Park, the project team had conducted control checks from the initial feasibility study of the park's initial design, minimizing the use of cuts and fills, reducing substantial level changes within the site, re-directing surface water drainage, and the re-use of transplanted trees for the site. Local rocks and boulders found within the site were used and integrated into the design for aesthetic and educational purposes. These elements had also become relics and attractions of the park. The park also provides large areas of lawn which is seldom in Hong Kong for maintenance reason. It demonstrates the site constraints had been turned into design opportunities and was well appreciated by the nearby residents.

Safety in urban park was another major concern which had been well addressed in the design of the park. The steepness of the site and the nearby slope edges required the installation of parapet metal fencing to avoid accidental fall. Handrail and fencing, together with tactile pavers were provided throughout the park to comply with local regulations and requirements to ensure a safe and user-friendly environment for all park users.

End of Paper