

Quarries in Hong Kong

Key Messages: Two existing quarries in Hong Kong are being rehabilitated to form green areas suitable for a variety of uses. They are also the major suppliers of rock products to local construction industry and important sites for recycling of surplus rock generated from local construction sites.

Background

Under an innovative scheme developed by the Government and local industry, the two existing quarries (Anderson Road and Lam Tei Quarries) are being rehabilitated to form attractive green areas. On completion, these areas will be suitable for a variety of uses that are beneficial to the community.

The plan to rehabilitate quarries was formulated in 1989 as an outcome of the Metroplan Landscape Strategy for Urban Fringe and Coastal Areas, which identified quarries as areas of degraded landscape requiring rehabilitation. The rehabilitation works typically involve major recontouring, extensive tree and shrub planting and erosion control.

Quarry Rehabilitation Contracts

A quarry rehabilitation contract is essentially a large site formation contract with rehabilitation being the main focus. All quarry rehabilitation contracts are revenue earning. In a revenue-earning contract, the contractor is required to pay the Government for the rights he enjoys under the contract, such as processing and selling of rock excavated within the quarries, manufacturing and selling of concrete and asphalt products, etc. These rights generate earnings for the contractor which are then used to cover the cost of the works and the payments to the Government in association with the contract. Under certain circumstances, the contractor may also be given permission to do other work, such as processing of imported rock. The Government collected revenue of about \$47.5 million in 2010 from the quarrying contracts.

Anderson Road and Lam Tei Quarries are existing quarries operating under rehabilitation contracts. The rehabilitation works of Turret Hill Quarry, Lamma Quarry and Shek O Quarry were completed in June 1995, December 2002 and January 2011 respectively.

Rehabilitated Turret Hill Quarry

The rehabilitated Turret Hill Quarry site is located at the northeast of Shatin New

Town, covering an area of 25 hectares. The quarry was established in mid-1960. The rehabilitation contract was signed in April 1989 and completed in June 1995. A total of 8.5 million tonnes of aggregates were produced from the quarry under this contract.

The following works were carried out under the contract:

- (a) flattening of the existing steep quarry faces to about 40° typically with benches at 20 m vertical intervals;
- (b) provision of ledges and crevices on rock faces to retain soil and moisture for vegetation; and
- (c) establishment of a self-sustaining soil-plant system involving soil replacement, hydroseeding and transplanting to blend in with the natural environment.

The vegetation planted in the quarry has established and blends in well with the surrounding environment. A portion of the site is currently occupied by the Environmental Protection Department as a refuse transfer station and the remaining portion is used by the Construction Industry Council Training Academy as a training ground.

Rehabilitated Lamma Quarry

The rehabilitated Lamma Quarry site is located on the north side of Sok Kwu Wan of Lamma Island, covering an area of 49 hectares with about 1 km of coastline.

The rehabilitation contract was signed in December 1995 and was completed in December 2002. The total amount of rock excavated from the quarry was 14.7 million tonnes. The following works were carried out under the contract:

- (a) formation of a new landform comprising a broad, gently sloping series of platforms bounded to the north with slopes which merge with the natural hillsides;
- (b) formation of a 4 hectares man-made lake with a natural, non-engineered appearance and gently shelving edges which can support reed bed; and
- (c) landscaping and planting of exotic and native trees to create a self-sustaining, maintenance-free, green environment with a similar biodiversity to the surroundings.

The mature exotic and native trees in the quarry has created a self-sustaining, maintenance-free green environment.

Rehabilitated Shek O Quarry

Shek O Quarry is located on the west coast of Cape D'Aguilar Peninsula on Hong Kong Island, covering an area of 45 hectares.

The rehabilitated contract was signed in March 1994 and completed in January 2011. The following works were carried out under the contract:

- (a) formation of a new Shek O Road to eliminate the hairpin bend of the old Shek O Road and shorten the road by 600 m, which was completed in 1997;
- (b) provision of nesting sites for peregrine falcons on the southern boundary cliffs;
- (c) creation of a new landform to blend in with the natural landscape of Cape D'Aguilar Peninsula, with a marine cove at the bottom suitable for recreational purpose; and
- (d) planting of slopes with exotic and native trees to blend in with the natural environment.

The site has been rehabilitated with the provision of a green cover planted with trees and shrubs. Today, many of these trees and shrubs have fully established and blended in nicely with the natural species in the area. The design also provides the flexibility for the marine cove to be converted into an immersed tube casting basin when necessary. It is the sole facility in Hong Kong that can serve for such purpose.

Anderson Road Quarry

Anderson Road Quarry is located on the southwestern slopes of the Tai Sheung Tok hill at Kowloon Peninsula, covering an area of 86 hectares.

The Contract (No. GE/96/10) was signed in March 1997 and the works were originally scheduled for completion in December 2013. In May 2009, a supplementary agreement was signed to extend the contract to June 2016 in order to enable the contractor to process and market the surplus rock excavated from the adjacent Development at Anderson Road project. The estimated total amount of excavated rock to be derived from the quarry is 50 million tonnes. The quarry supplied about 2.25 million tonnes of rock products to the local construction industry in 2010. The contractor is required to carry out the following works under the contract:

- (a) formation of a new landform consisting of 7 benches, separated by 20 m high, 65° rock slopes at the central portion (overall height about 200 m), 3 benches separated by 20 m high rock slopes on the east and west ends, and a platform of 40 hectares;

and

- (b) provision of a green cover to the final landform to blend in with the natural environment.

The site is being rehabilitated progressively to create attractive green areas. As the slopes and benches are completed, they are planted with trees and flowering shrubs to establish suitable habitats for birds and other animals.

Lam Tei Quarry

Lam Tei Quarry is located about 3 km north of Tuen Mun New Town, covering an area of about 30 hectares. The contract (No. 444/81) was signed in January 1982 and was completed in June 2007. The total amount of excavated rock derived from the quarry under the contract was about 27.1 million tonnes. The following works were carried out under the contract:

- (a) formation of a new landform consisting of 9 benches, separated by 15 m high 60° to 70° cut slopes, and a platform of 14.5 hectares;
- (b) re-vegetation of the final landform to a stable condition to eventually blend in with the surrounding natural environment;
- (c) provision of a self-sustaining ecosystem with a similar bio-diversity to the surrounding environment; and
- (d) provision of a natural and safe environment for future land use of the site.

Quarrying in Lam Tei continues with a new rehabilitation contract (No. GE/2006/03) following the completion of the previous contract. The contract was signed in October 2006 for completion in July 2015. The estimated total amount of excavated rock derived from the quarry under the new contract is 6.5 million tonnes. The quarry supplied 0.86 million tonnes of rock products to the local construction industry in 2010. The works under the current contract are essentially the same as those of the completed contract in 2007, except that the final platform will be lowered by a further 20 m and two new benches separated by a maximum of 10 m high 60° to 70° cut slopes will be formed.

The vegetation planted under the completed contract has been well established on the benches and the planting works under the current contract are in progress.

Important Sites for Recycling of Surplus Rock Generated from Local Construction Sites

The two existing quarries help to conserve Hong Kong's scarce natural resources by receiving surplus rock generated from local construction sites and recycling it into aggregates and other rock products and hence help relieve the pressure on the public fill reception facilities and thereby extend their life span. The Government also collected additional revenue for the imported rock. In 2010, about 820,000 tonnes of surplus rock was imported from the Development at Anderson Road project to Anderson Road Quarry for recycling into aggregates and other useful rock products. In the past 5 years, the total quantity of rock imported to the three quarries, namely, Anderson Road Quarry, Lam Tei Quarry and Shek O Quarry for recycling was about 1.95 million tonnes.

Major Suppliers of Rock Products to Local Construction Industry

The two existing quarries are the major suppliers of rock products to the local construction industry. In 2010, the total consumption for rock products was about 10.5 million tonnes. The two quarries supplied about 3.15 million tonnes (i.e. 30.0% of market share) of rock products to the local construction industry.

Supply of Rock Products in the Future

To ensure adequate supply of rock products in the future, the Mines Division monitors closely the supply and demand situation for rock products in Hong Kong.

Close liaison has been established since 1999 with the Land Resources Bureaux in the Pearl River Delta region to obtain updated information on their future rock production situation for the planning of quarrying in Hong Kong. It is noted from a visit to Hui Dong and Zhuhai Land Resources Bureaux in February 2010 that the demand of aggregates/rock products there was increasing. The quarries in the Mainland increased their production in order to cope with the demand. It appears that there is no major concern about the supply of aggregates/rock products to Hong Kong from the Mainland in the near future despite the demand in the Mainland being strong. However, with the commissioning of the planned infrastructure works in the Mainland, the demand may boost up again. It is necessary to keep a close watch on any changes in the supply and demand of the aggregates/rock products, particularly the implications on the demand arising from the up coming infrastructure works in Hong Kong.

The rock production operations at Lam Tei Quarry and Anderson Road Quarry are scheduled to end in mid-2014 according to the present rehabilitation contracts. Hong Kong's aggregate supply would have to rely more and more on imports from the Mainland. In order to regulate aggregate supply against possible fluctuation or disruption of imports from the Mainland, it is beneficial to maintain some local source of aggregate supply and

recycle surplus rock generated from local construction sites into useful rock products. The Government is proactively planning to extend the quarrying operation of Lam Tei Quarry for another contract up to 2022 and to investigate the feasibility of development of a new quarry in Hong Kong.

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