

**For discussion
on 24 April 2018**

Legislative Council Panel on Development

**PWP Item No. 108CD
West Kowloon Drainage Improvement –
Inter-Reservoirs Transfer Scheme**

PURPOSE

This paper briefs Members on the proposal to upgrade **108CD**, entitled “**West Kowloon drainage improvement – inter-reservoirs transfer scheme**”, to Category A at an estimated cost of \$ 1,222 million in money-of-the-day (MOD) prices for the construction of the inter-reservoirs transfer scheme (IRTS).

PROJECT SCOPE AND NATURE

2. The scope of works under **108CD** comprises the construction of -
 - (a) a water tunnel of about 2.8 kilometres with 3 metres diameter from the Kowloon Byewash Reservoir to the Lower Shing Mun Reservoir;
 - (b) an intake structure at the Kowloon Byewash Reservoir;
 - (c) an outfall structure at the Lower Shing Mun Reservoir; and
 - (d) ancillary works¹.
3. A plan showing the proposed works is at **Enclosure 1**.
4. Subject to funding approval of the Finance Committee (FC), we plan to commence the proposed works in the first quarter of 2019 for completion in the fourth quarter of 2022.

JUSTIFICATION

5. Most of the existing drainage systems in the developed districts of Sham Shui Po, Cheung Sha Wan and Lai Chi Kok were built more than 40 years ago. Owing to rapid developments and changes in land use over the years, the

¹ The ancillary works include slope upgrading works, landscaping works and associated roadworks etc.

capacities of the existing drainage systems have not achieved the required flood protection standard.

6. In this regard, the latest scope of the Lai Chi Kok Transfer Scheme (LCKTS) were formulated in July 2005². The LCKTS comprises the construction of the Lai Chi Kok drainage tunnel (LCKDT) and the proposed IRTS. The LCKDT intercepts the surface runoff from the uphill catchment areas for directly discharge to the Victoria Harbour. The proposed IRTS will transfer collected surface runoff from the Kowloon group of reservoirs³ to the Lower Shing Mun Reservoir, thereby creating a designated storage capacity in the Kowloon Byewash Reservoir to receive further surface runoff from the catchment. After completion of the LCKDT and the IRTS, the standard of flood protection in Sham Shui Po, Cheung Sha Wan and Lai Chi Kok will be improved to withstand rainstorms with return period of 1 in 50 years.

7. We implemented the LCKTS phase by phase, and the LCKDT was completed in 2012. The implementation of IRTS is essential, as an integrated part of the LCKTS, to improve the areas of Sham Shui Po, Cheung Sha Wan and Lai Chi Kok to achieve the required flood protection standard. The proposed IRTS will also strengthen our resilience in flood mitigation for combating climate change. In addition, transferring of collected surface runoff from the Kowloon group of reservoirs to the Lower Shing Mun Reservoir through the proposed IRTS will generate an estimated average annual additional fresh water yield of about 3.4 million cubic metres⁴.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be \$1,222 million in MOD prices.

PUBLIC CONSULTATION

² Please refer to paragraphs 20 and 21 below for relevant background information.

³ The Kowloon group of reservoirs comprises the Kowloon Reservoir, the Shek Lei Pui Reservoir, the Kowloon Reception Reservoir and the Kowloon Byewash Reservoir, of which the Kowloon Byewash Reservoir is topographically the lowest.

⁴ The estimated yield will vary subject to rainfall, which is unevenly distributed across the districts in the territory. The amount of rainfall in Hong Kong is also seasonal dependent, with rain mostly comes in heavy downpours within a short period of time during wet seasons. Coupled with its fluctuation between years, there would be a substantial difference in the quantities of collectible yield.

9. We consulted the Development and Housing Committee of the Sha Tin District Council on 4 January 2018. The Committee supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

10. The proposed works are designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and an environmental permit (EP) is required for the construction and operation of the proposed works. In April 2009, the Environmental Impact Assessment (EIA) report for the proposed works was approved under the EIAO and an EP for the project was issued in May 2009. The EIA report concluded that the environmental impact of the project can be controlled to within the criteria under the EIAO and the Technical Memorandum on EIA Process. We have recently conducted a review of the approved EIA report. The review concluded that the findings in the approved EIA report are still relevant and there is no material change to the designated project covered by the EP.

11. We will implement the measures recommended in the approved EIA report as well as the measures stipulated in the EP. We will carry out the environmental monitoring and audit programme to ascertain the effectiveness of the mitigation measures. We have included in the project estimate of the proposed works the cost for implementation of the necessary environmental mitigation measures.

12. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisances to within the established standards and guidelines through the implementation of the recommended mitigation measures in the relevant contract. These include the use of silenced construction equipment and temporary noise barriers to reduce noise impact. We will implement appropriate measures to safeguard the water quality of the reservoirs and water gathering grounds. In addition, water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to minimise potential water quality impact. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good practices will be properly implemented on site.

13. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will request the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise the

disposal of inert construction waste to the public fill reception facilities (PFRF⁵). We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formworks to further reduce the generation of construction waste.

14. At the construction stage, we will request the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will request the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

15. We estimate that the proposed works will generate 111 500 tonnes of construction waste. Of these, we will reuse 17 900 tonnes (16.1%) of inert construction waste on site, deliver 93 100 tonnes (83.5%) of inert construction waste to PFRF for subsequent reuse and 500 tonnes (0.4%) of non-inert construction waste at landfills for disposal. The total cost for disposal of construction waste at PFRF and landfills is estimated to be \$6.7 million for the proposed works (based on an unit charge rate of \$71 per tonne for disposal at PFRF and \$200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

16. We conducted a cultural heritage impact assessment for the proposed works in accordance with the EIAO. It was identified that there are historical structures⁶ in the vicinity of the proposed works, but no adverse impacts on the historical structures are anticipated. We will conduct condition survey for the historical structures prior to the construction works as a precautionary mitigation measure and submit the condition survey report to the Antiquities and Monuments Office of the Leisure and Cultural Services Department before the commencement of construction works in accordance with the conditions of the EP.

LAND ACQUISITION

⁵ PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

⁶ Including the Kowloon Byewash Reservoir Dam and Valve House, Shek Lei Pui Northeast Dam and Valve House, and Shek Lei Pui Southwest Dam, which are all Grade II historic structures.

17. The implementation of the proposed works will only involve government land. No land acquisition is required.

TRAFFIC IMPACTS

18. We have carried out a traffic impact assessment (TIA) for the proposed works. The TIA indicated that the construction and operation of the proposed works would not cause any significant traffic impact to the surrounding road network.

BACKGROUND INFORMATION

19. In September 2000, we upgraded **108CD** in Category B.

20. In March 2002, we upgraded part of **108CD** to Category A as **123CD** “Lai Chi Kok Transfer Scheme – preliminary design and investigations” at an estimated cost of \$33.3 million in MOD prices for engaging consultants to carry out the preliminary design and investigations for the LCKTS.

21. In July 2004, we commissioned an additional study under **123CD** to explore the feasibility of the proposed IRTS with a view to achieving both flood protection and collection of additional yield of local water. The study concluded that the proposed IRTS would serve dual objectives of substantially reducing the discharge into the existing drainage system in the Lai Chi Kok area and at the same time transforming the uncollectible rainwater into fresh water resources. The study also suggested that with the implementation of the proposed IRTS, the size of the main tunnel of the LCKDT could be reduced from 6.4 m to 4.9 m, while achieving the same general flood protection level. In July 2005, we issued an information paper CB(1)2006/04-05(01) to the Legislative Council Panel on Planning, Lands and Works to brief Members on the above revised scope of **108CD**.

22. In April 2007, we upgraded part of **108CD** to Category A as **150CD** “Inter-Reservoirs Transfer Scheme - environmental impact assessment, investigation and design” at an estimated cost of \$26.0 million in MOD prices for engaging consultants to carry out the environmental impact assessment study, investigation and detailed design for the proposed IRTS. In February 2008, the Secretary for Financial Services and the Treasury approved under delegated authority an increase in the approved project estimate of **150CD** from \$26 million by \$5.5 million to \$31.5 million to cover the additional cost of the site investigation works.

23. In April 2008, we upgraded part of **108CD** to Category A as **155CD**

“West Kowloon drainage improvement – Lai Chi Kok drainage tunnel” at an estimated cost of \$1,669.1 million in MOD prices for the construction of the LCKDT. The construction works of the LCKDT commenced in 2008 and were completed in 2012.

24. Of the 206 trees within the boundary of the proposed works, there is no registered Old and Valuable Tree. The proposed works will preserve 86 trees and involve the removal of 120 trees including 119 trees to be felled and one tree to be transplanted within the project site. Amongst these trees, two important trees⁷ will be affected during the implementation of the project. A summary of important trees affected is provided at **Enclosure 2**. We will incorporate planting proposal as part of the proposed works, including estimated quantities of 238 trees.

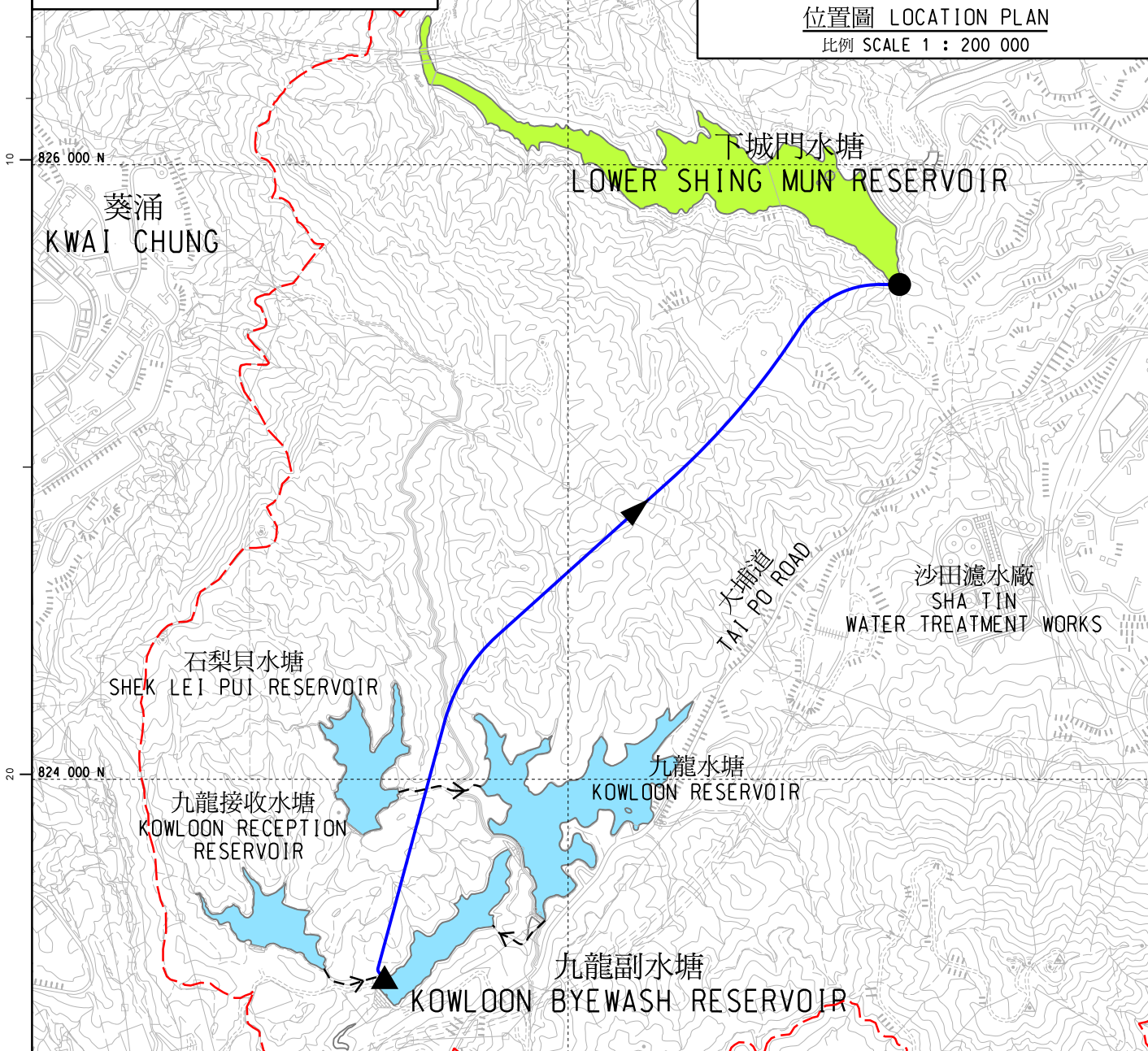
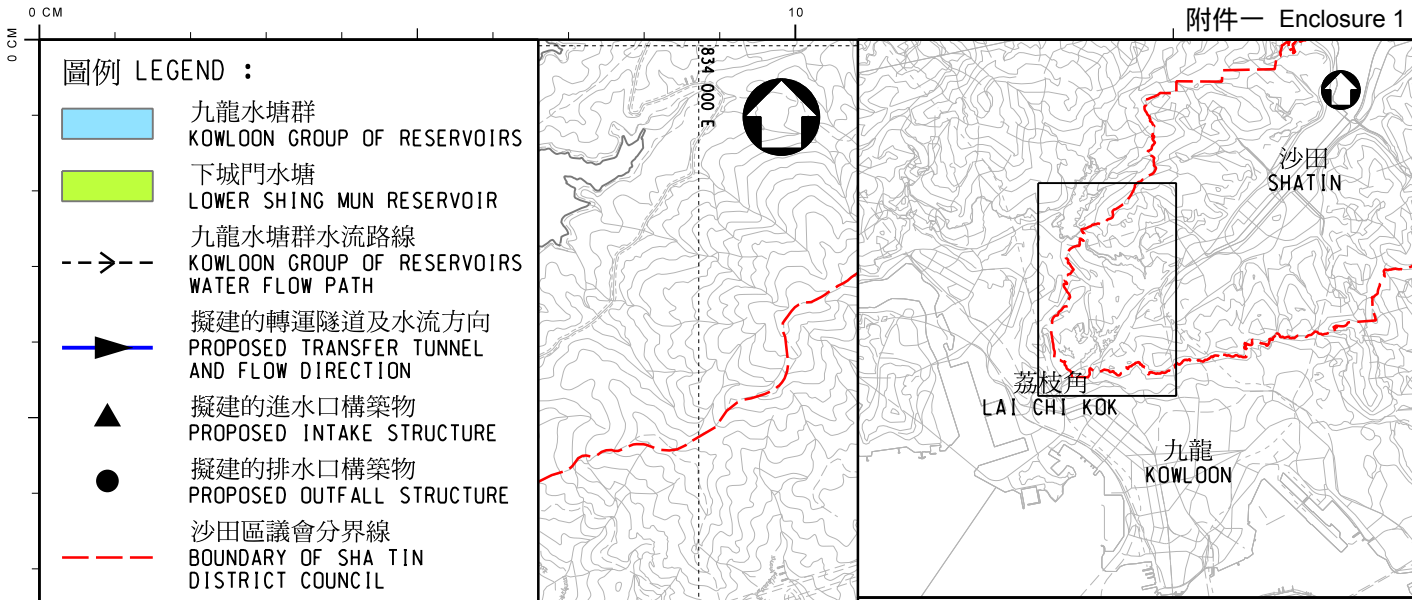
WAY FORWARD

25. We plan to seek funding approval from FC for upgrading **108CD** to Category A after consulting the Public Works Subcommittee. Members are invited to comment on the proposed funding application.

Development Bureau
Drainage Services Department
April 2018

⁷ “Important trees” refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria-

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of important persons or events;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (m) (measured at 1.3 m above ground level), or with height or canopy spread equal or exceeding 25 m.



圖則名稱 drawing title		繪畫 drawn	日期 date	修改項目 description	簡簽 initial
工務計劃項目108CD號 - 西九龍雨水排放系統改善計劃 - 水塘間轉運隧道計劃 PWP ITEM NO. 108CD - WEST KOWLOON DRAINAGE IMPROVEMENT - INTER-RESERVOIRS TRANSFER SCHEME		SIGNED W. H. CHAN	12 APR 2018	DCM/2018/005/B	1 : 20 000 OR AS SHOWN
		SIGNED Ir K. M. WONG	12 APR 2018		
		SIGNED Ir C. L. LO	12 APR 2018	保留版權 COPYRIGHT RESERVED	香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
圖則編號 drawing no.		部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION			

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PWP Item No. 108CD - West Kowloon Drainage Improvement – Inter-Reservoirs Transfer Scheme

Tree No. ¹	Species		Measurements			Amenity value ²	Form	Health condition	Structural condition	Suitability for transplanting ³		Conservation status ⁴	Recommendation	Department to provide expert advice to LandsD	Additional Remarks
	Scientific name	Chinese name	Height (m)	DBH ⁵ (mm)	Crown spread (m)	(Good/Fair/Poor)				(High/Medium/Low)	Remarks		(Retain/Transplant/Fell)		
T426	<i>Artocarpus hypargyreus</i>	白桂木	12	137	7	Good	Poor	Poor	Poor	Low	<ul style="list-style-type: none"> The tree is in poor form, poor health and poor structural condition, its transplant survival is low. Heavy pruning is needed to facilitate transplant. It would lead to permanent deformation of natural shape. 	RPPHK	Fell	Agriculture, Fisheries and Conservation Department	<ul style="list-style-type: none"> It is not registered Old and Valuable Tree. Status in China: Near Threatened (NT). Recorded in China Plant Red Data Book and Illustration of Rare & endangered plant in Guangdong Province. In Hong Kong, this species is relatively common and many localities of wild occurrence are in Country Parks under protection. The species has also been artificially propagated. The tree is in conflict with the construction works for the proposed tunnel and intake structure at the Kowloon Byewash Reservoir. The tree is located on slope with bending trunk and unbalanced tree crown, and its root ball is not extractable for transplant. The Kowloon Byewash Reservoir Dam is a Grade II historic structure with traffic load restriction imposed. Tree transplanting is considered infeasible. Compensatory planting of 2 nos. of <i>Artocarpus hypargyreus</i> will be provided.

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T428	<i>Artocarpus hypargyreus</i>	白桂木	8	105	6	Good	Poor	Poor	Poor	Low	<ul style="list-style-type: none"> The tree is in poor form, poor health and poor structural condition, its transplant survival is low. Heavy pruning is needed to facilitate transplant. It would lead to permanent deformation of natural shape. 	RPPHK	Fell	Agriculture, Fisheries and Conservation Department	<ul style="list-style-type: none"> It is not registered Old and Valuable Tree. Status in China: Near Threatened (NT). Recorded in China Plant Red Data Book and Illustration of Rare & endangered plant in Guangdong Province. In Hong Kong, this species is relatively common and many localities of wild occurrence are in Country Parks under protection. The species has also been artificially propagated. The tree is in conflict with the construction works for the proposed tunnel and intake structure at the Kowloon Byewash Reservoir. The tree is located on slope with unbalanced tree crown, and its root ball is not extractable for transplant. The Kowloon Byewash Reservoir Dam is a Grade II historic structure with traffic load restriction imposed. Tree transplanting is considered infeasible. Compensatory planting of 2 nos. of <i>Artocarpus hypargyreus</i> will be provided.

1 Tree(s) in the Register of Old and Valuable Trees should be highlighted with OVT number.

2 Amenity value of a tree should be assessed by its functional values for shade, shelter, screening, reduction of pollution and noise and also its fung shui significance, and classified into the following categories.

Good: important trees which should be retained by adjusting the design layout accordingly.

Fair: trees that are desirable to be retained in order to create a pleasant environment, which includes healthy specimens of lesser importance than "Good" trees.

Poor: trees that are dead, dying or potentially hazardous and should be removed.

3 Assessment shall take into account conditions of an individual tree at the time of survey (including health, structure, age and root conditions), site conditions (including topography and accessibility), and intrinsic characters of tree species (survival rate after transplanting).

4 Conservation status is based on the rarity and protection status of the species under relevant ordinances in Hong Kong, such as Rare and Precious Plants of Hong Kong, the International Union for Conservation of Nature (IUCN) Red List of Threatened Species and the Forests and Countryside Ordinance.

IUCN:NT – "Near Threatened" under IUCN Red List of Threatened Species

IUCN:VU – "Vulnerable" under IUCN Red List of Threatened Species

RPPHK – Species included in AFCD publication "Rare and Precious Plants of Hong Kong (2003)"

Cap.586 – Native plants listed in Protection of Endangered Species of Animals and Plants Ordinance, Cap. 586.

5 Diameter at Breast Height (DBH) of a tree refers to its trunk diameter at breast height (i.e. measured at 1.3m above ground level)