

For discussion
On 24 March 2005

**Legislative Council
Panel on Environmental Affairs**

Composite Paper on Five Sewage Collection and Treatment Schemes

PURPOSE

This paper seeks Members' support for the Administration's proposal of submitting the following five projects to the Public Works Subcommittee for consideration with a view to seeking Finance Committee's funding approval –

- (a) **4171DS** “North and South Kowloon sewerage, stage 2” at an estimated cost of \$53 million in money-of-the-day (MOD) prices;
- (b) **4204DS** “Wan Chai East and North Point sewerage, remaining works” at an estimated cost of \$214 million in MOD prices;
- (c) **4208DS** “Outlying Islands sewerage stage 1 phase 1 part 1 Ngong Ping village sewerage works” at an estimated cost of \$25 million in MOD prices;
- (d) **4215DS** “Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers” at an estimated cost of \$385 million in MOD prices; and
- (e) **4229DS** “North District and Tolo Harbour sewerage, sewage treatment and disposal – high priority works - Expansion of Shek Wu Hui sewage treatment works and Ting Kok Road pumping station No. 5” at an estimated cost of \$264 million in MOD prices.

PROPOSAL AND JUSTIFICATION

4171DS “North and South Kowloon sewerage, stage 2”

2. Some existing sewers at To Kwa Wan and Kowloon City will not be able to cope with the increasing sewage flows from the planned housing re-developments at Valley Road Estate, Tung Tau Cottage Area West and Inverness Road sites. We need to upgrade and replace the existing sewers by new sewers of larger diameters to provide the adequate capacity.

3. If we do not implement the proposed sewerage works, sewage generated from these re-developments may overflow during peak flow conditions.

4. The scope of the proposed sewerage works comprises the upgrading and replacement of the existing sewers of about 2 kilometres (km) at Fat Kwong Street, Shun Yung Street, Ko Shan Road, San Lau Street in To Kwa Wan, and Inverness Road, Junction Road, Dumbarton Road, Grampian Road and Prince Edward Road West in Kowloon City. Site plans showing the scope of the proposed works are at **Enclosure 1**.

5. We plan to commence construction works in late 2005 for completion in early 2008.

4204DS “Wan Chai East and North Point sewerage, remaining works”

6. The majority of the existing sewers in the Wan Chai East and North Point areas were built 30 years ago. Some of them are not able to cope with the increased sewage flows arising from population increase and new developments such as those located at Mount Butler, North Point Estate, former Government Supplies Department’s Oil Street Depot and Electrical and Mechanical Services Department’s depot at Caroline Hill Road. The proposed sewerage project is the last package of the sewerage improvement works to improve and upgrade the sewer systems in the Wan Chai East and North Point areas. With the progressive completion of the new trunk sewer systems under construction, we need to replace the existing branch sewers with inadequate capacity by new sewers of larger diameters and to rehabilitate old sewers with structural problems.

7. If we do not implement the proposed sewerage works, sewage generated from Wan Chai East and North Point may overflow during peak flow conditions.

8. The scope of the proposed sewerage works comprises-

- a) construction of sewers of approximately 8.5 km in Wan Chai East and North Point;
- b) rehabilitation of existing sewers of approximately 600 metres (m) in North Point; and
- c) rectification of expedient connections in Wan Chai East and North Point.

A site plan showing the scope of the proposed works is at **Enclosure 2**.

9. We plan to commence construction in mid 2005 for completion in early 2010.

4208DS “Outlying Islands sewerage stage 1 phase 1 part 1 Ngong Ping village sewerage works”

10. There is no public sewer system at Ngong Ping village. Sewage generated is mainly treated and disposed of by means of privately owned septic tank and soakaway systems¹. To tie in with the planned tourism and recreation developments in Ngong Ping which will be completed in early 2006, we are now constructing a tertiary sewage treatment plant and the associated trunk and branch sewers in Ngong Ping and the works will be completed in late 2005. To provide proper treatment to the sewage generated from the Ngong Ping village, we need to construct the public sewerage for the Ngong Ping village to convey the sewage generated to the Ngong Ping sewage treatment plant for treatment and disposal.

11. If we do not implement the proposed sewerage works, Ngong Ping village will remain unsewered and sewage generated cannot be collected for treatment at the Ngong Ping sewage treatment plant.

12. The scope of the proposed Ngong Ping village sewerage works comprises-

- a) construction of sewers of about 2.6 km; and
- b) construction of two small underground sewage pumping chambers and twin pumping mains of about 170 m.

A site plan showing the scope of the proposed works is at **Enclosure 3**.

13. We plan to commence construction in end 2005 for completion in early 2008.

¹ Septic tank and soakaway systems operate by utilizing the microorganisms in the septic tank to degrade the suspended solids in the wastewater. Effluent leaving the septic tank would then percolate through the gravel in the soakaway pit where the organic pollutants and pathogens will be further degraded and removed by the microorganisms in a natural manner. Sludge generated in the septic tank should be tankered away periodically.

4215DS “Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers”

14. There is no public sewerage at Kam Tin and Nam Sang Wai. Sewage generated from these areas is treated and disposed of by means of privately owned sewage treatment plants or septic tank and soakaway systems. On the other hand, the sewerage at Au Tau will not be able to cope with the sewage flow arising from the upcoming residential developments. To cope with the sewerage demand at Kam Tin and Nam Sang Wai, we need to construct sewers in these areas to convey the sewage to the existing Yuen Long sewage treatment works for treatment and disposal. We also need to upgrade some existing sewers at Au Tau area to cope with the increasing sewage flows arising from the new developments.

15. If we do not implement the proposed sewerage works, sewage generated from Kam Tin and Nam Sang Wai cannot be conveyed to Yuen Long sewage treatment works for treatment. The existing sewers at Au Tau will also be under capacity resulting in operational problems of the sewers and possible spillage of polluted discharge in the catchment.

16. The scope of the proposed sewerage project comprises -

- a) construction of trunk sewers of 7.5 km in length;
- b) construction of three sewage pumping stations and twin rising mains of 5.7 km in length at Au Tau, Kam Tin and Nam Sang Wai.

A site plan showing the scope of the proposed works are at **Enclosure 4**.

17. We plan to commence construction in end 2005 for completion in mid 2009.

4229DS “North District and Tolo Harbour sewerage, sewage treatment and disposal – high priority works - Expansion of Shek Wu Hui sewage treatment works and Ting Kok Road pumping station No.5”

18. This project consists of two key elements namely, the upgrading of the existing Ting Kok Road pumping station No. 5 and the upgrading of the existing Shek Wu Hui sewage treatment works (SWHSTW).

Ting Kok Road pumping station

19. The function of the existing Ting Kok Road pumping station No. 5 is to pump sewage collected from Ting Kok Road to the Tai Po sewage treatment works for treatment before disposal. It has a design flow capacity of about 2 900 cubic meters (m³) per day. Due to continuing developments in recent years and expansion of sewer networks along Ting Kok Road to Tai Mei Tuk, the flow to the Ting Kok Road pumping station No. 5 is approaching its design capacity. Based on the latest planning figures, we forecast the sewage flow from residential, commercial and other developments along Ting Kok Road will increase to 11 520 m³ per day by 2016. To cope with the projected increase in sewage flow, we propose to re-construct Ting Kok Road pumping station No. 5 in order to increase the flow capacity of the pumping station to 11 520 m³ per day.

20. If we do not implement the proposed upgrading works, part of the sewage generated along Ting Kok Road cannot be conveyed to Tai Po sewage treatment works for treatment.

21. The scope of Ting Kok Road pumping station No. 5 project comprises the construction of-

- a) a new Ting Kok Road pumping station No.5 and twin rising mains of 350 m in length ; and
- b) gravity sewers of 250 m in length.

A site plan showing the scope of the proposed works is at **Enclosure 5**.

Expansion of Shek Wu Hui sewage treatment works

22. The existing SWHSTW is a secondary treatment plant with a design capacity of 80 000 m³ per day serving Sheung Shui and Fanling districts. Due to the continuing population growth and expansion of the sewerage network in Sheung Shui and Fanling districts in recent years, the flow to SWHSTW has reached its design capacity. Based on the latest planning figures, we forecast the sewage flow from residential, commercial, industrial and other developments will increase to about 93 000 m³ per day by 2011. To protect the receiving water bodies from pollution due to the projected increase in sewage flows and pollutant loads, we need to upgrade the treatment capacity of SWHSTW to 93 000 m³ per day.

23. If we do not proceed with the proposed upgrading works, the additional sewage flows will not receive proper treatment before discharge. This

will result in the deterioration of water quality in the receiving water bodies.

24. The scope of the expansion of SWHSTW comprises -

- a) construction of one bioreactor and the associated facilities;
- b) construction of an air blower house;
- c) construction of two final sedimentation tanks;
- d) modification to four existing bioreactors ;
- e) provision of sludge treatment facilities including extension to existing sludge dewatering house, one dewatering press and two sludge conditioning tanks;
- f) installation of instrumentation and control; and
- g) provision of ancillary works including power supply systems, pipeworks, deodorisation facilities, building services installations, fire services installations, lifting appliances, cabling works and road works.

A site plan showing the scope of the proposed works is at **Enclosure 6**.

25. We plan to start the proposed works in late 2005 for completion in late 2009.

FINANCIAL IMPLICATIONS

26. We estimate the project costs² and the additional annual recurrent costs² of the proposed works to be –

	Project cost \$ million (MOD)	Annual recurrent cost \$ million
(a) North and South Kowloon sewerage, stage 2	53.0	0.0
(b) Wan Chai East and North Point sewerage, remaining works	214.0	0.0
(c) Ngong Ping village sewerage works	25.0	0.51
(d) Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers	385.0	4.48

² These are latest estimates. We would finalize the project costs and new job opportunities, and include the cost breakdown prior to submitting the proposals to the PWSC for consideration.

	Project cost \$ million (MOD)	Annual recurrent cost \$ million
(e) North District and Tolo Harbour sewerage, sewage treatment and disposal – high priority works - Expansion of SWHSTW and Ting Kok Road pumping station No.5	264.0	5.26
(i) Expansion of SWHSTW	212.5	4.48
(ii) Ting Kok Road pumping station No.5	51.5	0.78
Total	941.0	10.25

27. Based on the current level of expenditure on operation and maintenance of sewerage facilities, the proposed works by themselves will lead to an increase in the recurrent cost of providing sewage services by about 0.63%, which will need to be taken into account in determining sewage charges.

28. We estimate that the proposed projects will create about 586 jobs (495 for labourers and another 91 for professional/technical staff).

PUBLIC CONSULTATION

4171DS “North and South Kowloon sewerage, stage 2”

29. Environmental Protection Department (EPD) and Drainage Services Department (DSD) consulted the Kowloon City District Council on 20 January 2005 on the proposed Stage 2 works. The Kowloon City District Council supported in principle the implementation of the proposed works. Some Members requested us to maintain close liaison with the affected parties, accommodate their suggestions as far as possible and ensure that the works would be completed within the shortest possible period.

4204DS “Wan Chai East and North Point sewerage, remaining works”

30. DSD consulted the Planning, Transport and Environmental Protection Committee of the Wan Chai District Council and the Works and Development Committee of the Eastern District Council on 25 January 2005 and 3 February 2005 respectively. Members supported the implementation of the proposed works.

4208DS “Outlying Islands sewerage stage 1 phase 1 part 1 Ngong Ping village sewerage works”

31. EPD and DSD conducted a public consultation meeting on 28 June 2004 at Po Lin Monastery on the proposed works with the villagers’ representatives. They supported the implementation of the project. EPD and DSD also consulted the Environmental Improvement and Food Hygiene Committee of the Islands District Council on the proposed works on 20 September 2004. Members supported the implementation of the proposed works.

4215DS “Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers”

32. DSD consulted the Environmental Improvement Committee of the Yuen Long District Council on the proposed works on 17 March 2004. EPD and DSD further consulted the Environmental Improvement Committee of the Yuen Long District Council on the proposed works on 17 May 2004. Members supported the implementation of the proposed works.

4229DS “North District and Tolo Harbour sewerage, sewage treatment and disposal – high priority works - Expansion of Shek Wu Hui sewage treatment works and Ting Kok Road pumping station No.5”

33. EPD and DSD consulted the Works and Environment Committee of the North District Council on the upgrading of SWHSTW project on 19 July 2004. Members of North District Council supported the project. EPD and DSD also consulted the Environment, Housing and Works Committee of the Tai Po District Council on Ting Kok Road pumping station No. 5 project on 12 November 2004. Members supported the proposed Ting Kok Road pumping station No. 5 project.

ENVIRONMENTAL IMPLICATIONS

34. DSD has conducted the necessary Environmental Reviews and Environmental Impact Assessment Studies for the proposed works in accordance with EPD’s requirements and the Environmental Impact Assessment (EIA) Ordinance as applicable. The initial finding of the studies indicated that with the implementation of mitigation measures, the proposed works will not give rise to long term adverse environmental impacts. For short term impacts during construction, DSD will control noise, dust, site run-off, suspended solids in inland and coastal waters, and other related impacts to comply within established standards and guidelines. Mitigation measures such as providing temporary noise barriers and using silenced construction machines to reduce noise generation,

water-spraying to reduce dust emission, and strict implementation of sewage flow diversion schemes will be adopted. DSD will also require the works contractors to submit a waste management plan (WMP) for approval. The WMP will include appropriate measures to reduce, reuse and recycle construction and demolition materials (C&DM).

35. We estimate that the proposed sewerage works will generate C&DM as shown below-

Project	Total C&DM (m ³)	Reuse on site (m ³)	Fill in public filling areas ³ (m ³)	Dispose at landfills (m ³)	The notional cost ⁴ of accommodating C&D waste at landfill site (based on a notional unit cost of \$125/m ³) \$
4171DS	6,281	3,580	1,891	810	101,250
4204DS	28,400	8,520	19,030	850	106,250
4208DS	9,560	4,680	4,680	200	25,000
4215DS	114,900	84,630	21,320	8,950	1,118,750
4229DS	37,600	4,000	33,550	100	12,500

36. DSD will ensure that the day-to-day operations on site should comply with the approved WMP. We will reuse public fill generated from the projects either on site or on other construction sites as far as possible. DSD will require the contractors to implement necessary measures to minimize the generation of C&DM and to reuse and recycle C&DM.

ADVICE SOUGHT


37. Members are invited to support the Administration's proposal of upgrading the following five projects to Category A for consideration by the Public Works Subcommittee in May/June 2005 with a view to seeking funding approval by the Finance Committee in June 2005 –

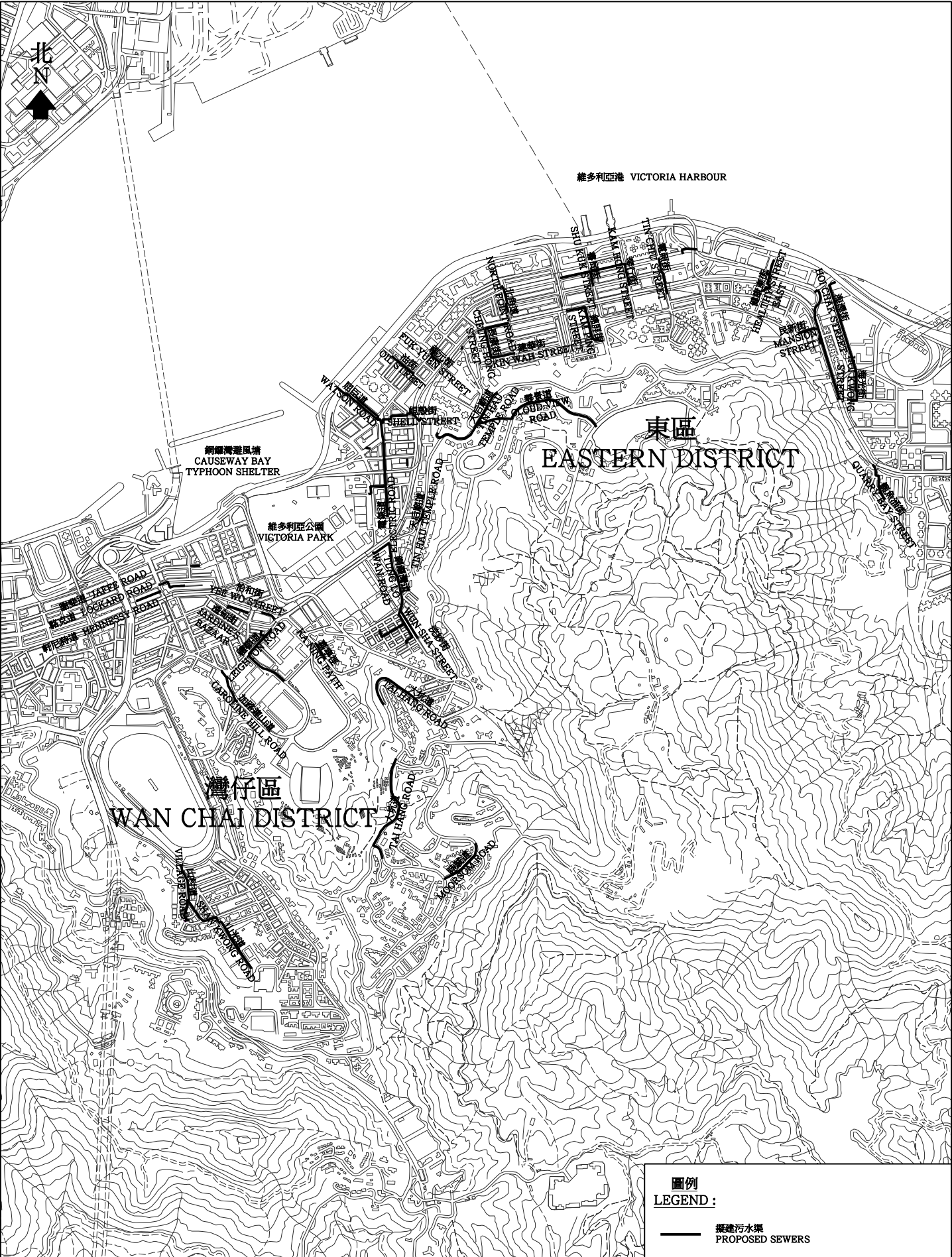
³ A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering and Development.


⁴ This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m³), nor the cost to provide new landfills (which are likely to be more expensive) when existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

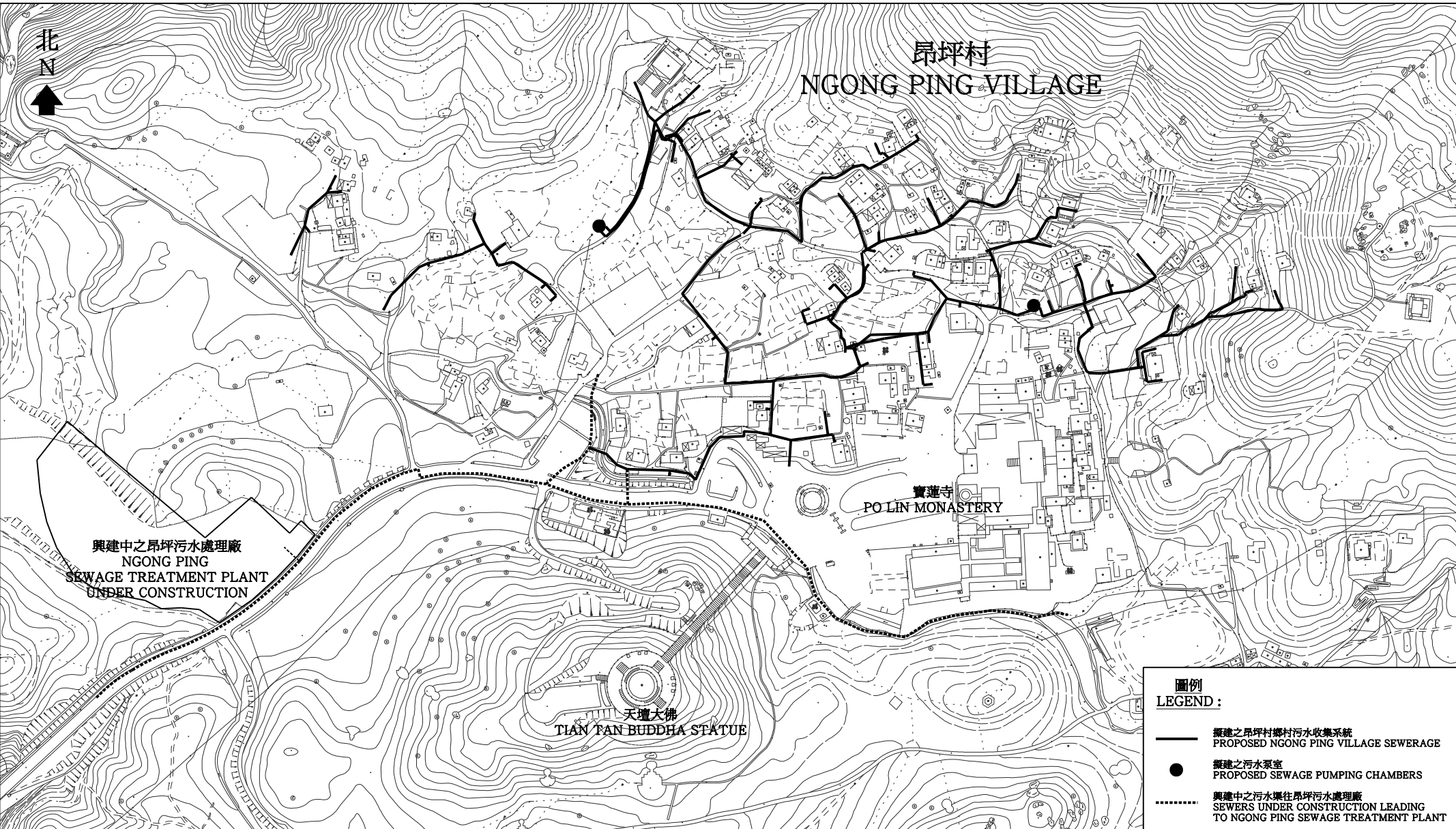
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
Environment, Transport and Works Bureau
March 2005

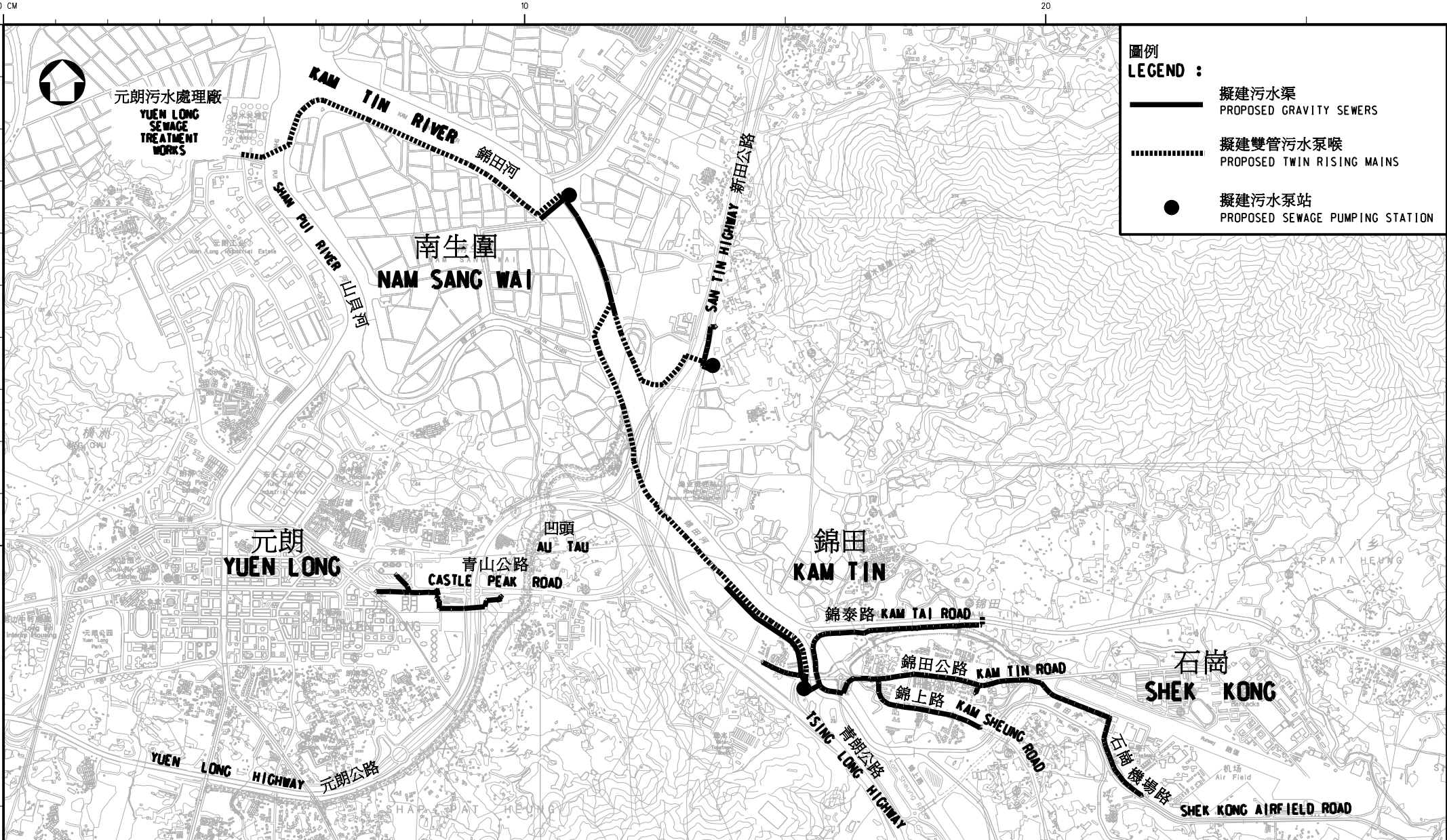
圖則名稱 drawing title	繪畫 drawn	日期 date	圖則編號 drawing no.	比例 scale	
工務計劃項目第4171DS號 九龍北部及南部污水系統 改善工程第2階段 PWP ITEM NO. 4171DS NORTH AND SOUTH KOWLOON SEWERAGE STAGE 2	C. W. CHAN	07-03-2005	DSS/2005/004	N. T. S.	
	核對 checked	日期 date			
	C. L. LEUNG	07-03-2005	保留版權 COPYRIGHT RESERVED		
	批核 approved	日期 date	 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION		
C. M. CHOI	07-03-2005				
部門 office 淨化海港計劃部 HARBOUR AREA TREATMENT SCHEME DIVISION					




圖則名稱 drawing title	繪畫 drawn C.W. CHAN	日期 date 24-02-2005	圖則編號 drawing no. DCM/2005/006	比例 scale N.T.S.
工務計劃項目第4204DS號 灣仔東部及北角 污水收集系統-餘下工程 PWP ITEM NO. 4204DS WAN CHAI EAST AND NORTH POINT SEWERAGE - REMAINING WORKS	核對 checked K.M. MAK	日期 date 24-02-2005	保留版權 COPYRIGHT RESERVED	
	批核 approved W.K. HO	日期 date 24-02-2005	 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION	
	部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION			



圖則名稱 drawing title 工務計劃項目第4208DS/B號 昂坪鄉村污水收集系統工程平面圖 PWP ITEM NO. 4208DS/B NGONG PING VILLAGE SEWERAGE LAYOUT PLAN	繪畫 drawn C.W. CHAN	日期 date 08-03-2005	圖則編號 drawing no. DCM/2005/007	比例 scale N.T.S.
	核對 checked C.L. LEUNG	日期 date 08-03-2005	保留版權 COPYRIGHT RESERVED	
	批核 approved C.M. CHOI	日期 date 08-03-2005	 <div>香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION</div>	
	部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION			



圖則名稱 drawing title 工務工程計劃第215DS號 元朗及錦田污水收集及排放計劃 - 錦田污水主幹渠第1期工程及凹頭污水幹渠工程 PWP ITEM NO.215DS YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL - KAM TIN TRUNK SEWERAGE PHASE 1 AND AU TAU TRUNK SEWERS	繪 畫 drawn	SIGNED	K. F. NG	日期 date 23.2.05	圖則編號 drawing no. DDN/215DS/9935	比例 scale N.T.S.
	核 對 checked	SIGNED	S. K. LEUNG	日期 date 23.2.05		
	批 核 approved	SIGNED	K. T. LAM	日期 date 23.2.05	保 留 版 權 COPYRIGHT RESERVED	
	部 門 office					香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
	污 水 工 程 部 SEWERAGE PROJECTS DIVISION					

