

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 704 DRAINAGE

#### Civil Engineering Drainage and erosion protection

#### 59CD - West Kowloon drainage improvement, stages 2 and 3

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **59CD**, entitled West Kowloon drainage improvement, stage 2 phase 1 works , to Category A at an estimated cost of \$1762.9 million in money-of-the-day prices; and
- (b) the retention of the remainder of **59CD**, retitled West Kowloon drainage improvement, stage 2 phase 2 and stage 3 , in Category B.

### PROBLEM

West Kowloon is susceptible to frequent flooding due to the inadequate capacity of the existing drainage system in the area.

**/PROPOSAL .....**

## PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for Works, proposes to upgrade part of **59CD** to Category A at an estimated cost of \$1762.9 million in money-of-the-day (MOD) prices for the West Kowloon drainage improvement, stage 2 phase 1 works.

## PROJECT SCOPE AND NATURE

3. The original scope of **59CD** West Kowloon drainage improvement, stages 2 and 3 comprises the construction of 94 kilometers of drains in West Kowloon in two stages as follows –

- (a) stage 2 comprises improvement works to about 56 kilometers of drains which are critically inadequate in capacity; and
- (b) stage 3 comprises improvement works to about 38 kilometers of drains which are moderately inadequate in capacity.

4. In April 1997, we upgraded part of **59CD** to Category A as **88CD** West Kowloon drainage improvement, stage 2 - consultants fees and investigations for the engagement of consultants to carry out site investigations and detailed design for the stage 2 drainage improvement works. During the design stage, we have critically reviewed the overall drainage improvement strategy for both stages 2 and 3 works, with due consideration given to space constraints, conflicts with underground structures and numerous utilities of substantial sizes, and traffic disruptions which will arise during the execution of the works in the heavily built-up areas of West Kowloon. With the aim of overcoming these constraints and minimizing the disruptive impact to the public, we propose to repackage the works<sup>1</sup> for stages 2 and 3 as follows –

- (a) the construction of approximately 22.7 kilometers of drains and culverts as stage 2 phase 1 works in Mong Kok, Tsim Sha Tsui, and part of Sham Shui Po and Yau Ma Tei;

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<sup>1</sup> We will complete stormwater drainage improvement works at the lower catchment areas first and then gradually proceed with the works in the upper catchment areas where the risk of flooding is less critical.

/(b) .....

- (b) the construction of the Tai Hang Tung Flood Storage Scheme and the Kai Tak Transfer Scheme as stage 2 phase 2 works; and
- (c) the construction of approximately 25 kilometers of drains as stage 3 works in Yau Yat Tsuen, Ho Man Tin, Kowloon Tong, and part of Yau Ma Tei and Sham Shui Po.

5. The revised drainage improvement strategy is to construct a flood storage scheme at the Tai Hang Tung Recreation Ground (i.e. the Tai Hang Tung Flood Storage Scheme), a stormwater transfer tunnel from Kowloon Tong to San Po Kong (i.e. the Kai Tak Transfer Scheme) and a second tunnel diverting stormwater away from West Kowloon (i.e. the Lai Chi Kok Transfer Scheme). This will reduce the overall length of drains to be constructed under the original stages 2 and 3 from 94 kilometers to about 48 kilometers, and therefore will minimise traffic impacts during construction. The revised drainage improvement strategy is illustrated in the location plan at Enclosure 1.

6. The part of the project we now propose to upgrade to Category A is the stage 2 phase 1 drainage improvement works mentioned in paragraph 4(a) above. A location plan for the proposed works is shown at Enclosure 2. The scope of works comprises the construction of -

- (a) about 22 kilometers of drain pipes of diameters ranging from 300 millimeters to 2 100 millimeters; and
- (b) about 0.7 kilometers of single-cell or two-cell box culverts, of cell size up to 4 800 millimeters x 3 500 millimeters.

7. The remainder of **59CD**, comprising the construction of the drainage improvement works under stage 2 phase 2 and stage 3 mentioned in paragraphs 4(b) and (c) above, will remain in Category B.

## JUSTIFICATIONS

8. The West Kowloon service area covers major residential and

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commercial districts comprising Sham Shui Po, Mong Kok, Yau Ma Tei, part of Tsim Sha Tsui, Yau Yat Chuen, Kowloon Tong and Ho Man Tin. The drainage catchment is large and covers the natural hillsides behind the urban area as indicated in the plan at Enclosure 3. We developed the existing drainage system some thirty years ago to meet the flow requirements at that time.

9. Owing to rapid developments and changes in land use in West Kowloon over the years, some natural ground and slopes have been paved over and have become impermeable. Rainwater which would previously dissipate naturally through ground filtration can no longer do so. This has resulted in increased surface run-offs which have in turn overloaded the drainage system. As a result, many areas of West Kowloon are prone to frequent flooding during heavy rainstorms.

10. A preliminary study by DSD in 1990 indicated that most of the existing trunk drains in West Kowloon were inadequate in capacity. Since then, we formulated a strategy to progressively upgrade the capacity of the drainage system to cope with development needs and to alleviate the risks of flooding.

11. In June 1994, we engaged consultants to examine the deficiencies of the drainage system in West Kowloon and to develop a drainage master plan for improvement of the system. The study was completed in late 1995. It identified that some 103 kilometers of the existing drains did not meet the current standards for flood protection and recommended upgrading works to be implemented in a three-stage improvement programme.

12. In April 1998, we commenced construction of the stage 1 drainage improvement works in conjunction with the sewage improvement works under **290DS** North West Kowloon sewerage stage 3 phase 2 .

13. Following the completion of the detailed design on the stage 2 phase 1 works in March 1999, we now propose to upgrade about 22.7 kilometers of existing drains in Sham Shui Po, Mong Kok, Yau Ma Tei and Tsim Sha Tsui. These drains are critically inadequate in capacity and should be replaced with larger pipes or box culverts to provide the required capacity. The proposed improvement works will form an integral part of the overall flood control strategy for West Kowloon.

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14. Part of the proposed drainage works (i.e. about 0.3 kilometers of 2100 millimeters drain pipes) at Yen Chow Street fall within the site boundary of the West Rail project of the Kowloon Canton Railway Corporation (KCRC). The alignment of the drainage works crosses the proposed West Rail tunnel, roads and bridges. In order to avoid interface problems with KCRC contractors and to ensure cost-effectiveness and timely completion of the drainage works, we will entrust the proposed drainage works to KCRC for construction in conjunction with the West Rail project. We will reimburse KCRC the actual cost of the works plus relevant on-costs subject to a ceiling of \$44.6 million.

### FINANCIAL IMPLICATIONS

15. We estimate the capital cost of the proposed works to be \$1762.9 million in MOD prices (see paragraph 16 below), made up as follows –

	<b>\$ million</b>	
(a) Construction of drainage works	1,191.5	
(i) pipes	1,062.3	
(ii) box culverts	129.2	
(b) Consultants fees for construction stage	55.4	
(c) Resident site staff costs	137.2	
(d) On-cost <sup>2</sup>	4.6	
(e) Contingencies	138.8	
Sub-total	1,527.5	(at December 1998 prices)

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<sup>2</sup> We will pay an on-cost of 11.6 % of the construction cost of entrusted works to KCRC for project management and associated costs. We do not apply the standard 16.5% on-cost as KCRC is not required to carry out the design work for this project.

		<b>\$ million</b>
	(f) Provision for price adjustment	235.4
	Total	1,762.9 (in MOD prices)

A breakdown by man months of the estimate for consultants fees is at Enclosure 4.

16. Subject to approval, we will phase the expenditure as follows –

Year		\$ million (Dec 1998)	Price adjustment factor	\$ million (MOD)
1999	2000	28.6	1.02625	29.3
2000	2001	250.9	1.06217	266.5
2001	2002	266.3	1.09934	292.8
2002	2003	271.1	1.13782	308.5
2003	2004	268.9	1.17765	316.7
2004	2005	235.4	1.21886	286.9
2005	2006	162.3	1.26152	204.7
2006	2007	44.0	1.30568	57.5
Total		1,527.5		1,762.9

17. We have derived the MOD estimates on the basis of the Government 億 latest forecast of trend labour and construction prices for the period 1999 to 2007. We will tender the proposed drainage works under standard remeasurement contracts because we are uncertain about the existence and exact

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locations of underground utilities such as electric cables, telephone lines and water mains. The contracts will allow for price adjustments as the contract periods will exceed 21 months. KCRC will tender the proposed entrustment works as part of the contract for West Rail Yen Chow Street station.

18. There will be no additional recurrent expenditure as the works comprise mainly the replacement of existing stormwater drains.

### **PUBLIC CONSULTATION**

19. In December 1995, we completed a study under **65CD** West Kowloon stormwater drainage improvement study - consultants fees and investigation to examine the deficiencies of the existing drainage system in West Kowloon and to develop a drainage master plan for improving the system. We presented the findings and recommendations of the study to Sham Shui Po and Kowloon City District Boards on 9 November 1995 and to Yau Tsim Mong District Board on 16 November 1995. The District Boards supported the implementation of the entire West Kowloon drainage improvement project.

20. On completion of the detailed investigation and design of the relevant stages/phases of works, we consulted the Traffic and Transport Committee of Yau Tsim Mong Provisional District Board on 26 November 1998 and the Sham Shui Po Provisional District Board on 11 February 1999 on the proposed stage 2 phase 1 drainage improvement works, including the temporary traffic arrangements and environmental mitigation measures during construction. Both supported the implementation of the proposed works.

21. We consulted the LegCo Panel on Planning, Lands and Works on 13 May 1999. The Panel supported the proposed West Kowloon drainage improvement works.

### **ENVIRONMENTAL IMPLICATIONS**

22. The Director of Environmental Protection completed an Environmental Review in August 1995 and concluded that the project would have no long term environmental impacts and an environmental impact assessment was not necessary. For short term impacts during construction, we will control noise,

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dust and site run-off impacts to within established standards and guidelines through the implementation of recommended pollution control measures in the works contracts.

## LAND ACQUISITION

23. The project does not require land acquisition.

## BACKGROUND INFORMATION

24. We upgraded **59CD** West Kowloon stormwater drainage improvement to Category B in December 1993. In June 1994, we upgraded part of **59CD** to Category A as **65CD** West Kowloon stormwater drainage improvement study - consultants fees and investigation with an approved project estimate of \$15.9 million to engage consultants to examine the deficiencies of the drainage system in West Kowloon and to develop a drainage master plan for improvement. We completed the study in December 1995.

25. In April 1996, we engaged consultants to carry out site investigations and detailed design for the West Kowloon drainage improvement stage 1 works under a Category D project **84CD** West Kowloon stormwater drainage improvement, stage 1 - site investigation and detailed design with an approved project estimate of \$7.4 million. We completed the detailed design work in May 1997.

26. In April 1997, we upgraded part of **59CD** to Category A as **88CD** West Kowloon drainage improvement, stage 2 - consultants fees and investigations with an approved project estimate of \$68 million for engaging consultants to carry out site investigations and detailed design for the stage 2 drainage improvement works. The consultancy started in June 1997. As it progressed, we revised our drainage improvement strategy and decided to implement stage 2 works in 2 phases.

27. In June 1997, we upgraded part of **59CD** to Category A as **89CD** West Kowloon drainage improvement, stage 1 works with an approved project estimate of \$464 million to implement the stage 1 improvement works. We commenced the construction of the stage 1 drainage improvement works in

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conjunction with the sewage improvement works under **290DS** North West Kowloon sewerage stage 3 phase 2 in April 1998 for completion in January 2003.

28. We engaged consultants to design the proposed works in stage 2 phase 1. We completed this work in March 1999. We plan to start the proposed improvement works in December 1999 for substantial completion in 2004.

29. We have carried out traffic impact assessments for the implementation of the proposed works, with a view to minimising traffic impacts during construction and to meet the programmed completion dates. We have discussed and obtained in principle agreements with the Police Department and the Transport Department on traffic arrangements required for the execution of the works. These arrangements include minor local traffic diversions, works to be carried out in short sections and works to be carried out in non-peak hours. We will obtain the approval of the Traffic Management Liaison Group with members from relevant Government departments, public transport operators and utility companies on the proposed traffic arrangements before we commence the works.

30. We have commenced the planning and design work for the Tai Hang Tung Flood Storage Scheme and the Kai Tak Transfer Scheme. We plan to start the construction of both schemes in late 2000 for completion before the rainy season of 2004. Together with the completion of drainage upgrading works under stage 1 and stage 2 phase 1 which are programmed for completion by 2003 and 2004 respectively, flooding problems currently experienced at Mong Kok will be resolved.

31. We plan to start the construction of the stage 3 works in 2001 with a view to substantially completing all the drainage improvement works in West Kowloon in 2007.

32. We have also commissioned a feasibility study on the second stormwater tunnel (the Lai Chi Kok Transfer Scheme) to intercept rainwater from the upper catchment of West Kowloon.

**May 1999**

(PWSC0135/WIN5)

**59CD - West Kowloon drainage improvement, stages 2 and 3**

**Breakdown of estimate for consultants fees –**

<b>Consultants</b>		<b>staff costs</b>		<b>Estimated man months</b>	<b>Average MPS* salary point</b>	<b>Multiplier Factor</b>	<b>Estimated fee (\$ million)</b>
(a)	Consultants fees for construction stage	Professional		300	40	2.4	45.2
		Technical		203	16	2.4	10.2
(b)	Resident site staff costs	Professional		570	40	1.7	60.8
		Technical		2,138	16	1.7	76.4
		<b>Total consultants</b>				<b>staff costs</b>	<b>192.6</b>

\* MPS = Master Pay Scale

**Notes**

1. A multiplier factor of 2.4 is applied to the average MPS point to arrive at the full staff costs including the consultants overheads and profit, as the staff will be employed in the consultants offices (at 1.4.1998, MPS pt. 40 = \$62,780 per month and MPS pt. 16 = \$21,010 per month). A multiplier factor of 1.7 is applied in the case of site staff supplied by the consultants.
2. The figures given above are based on the fee proposal from the consultants undertaking the investigations, design and construction supervision of the West Kowloon drainage improvement, stage 2 works. We will negotiate the consultants fees and resident site staff costs with the consultants after the approval of funding.

(PWSC0135/WIN5)

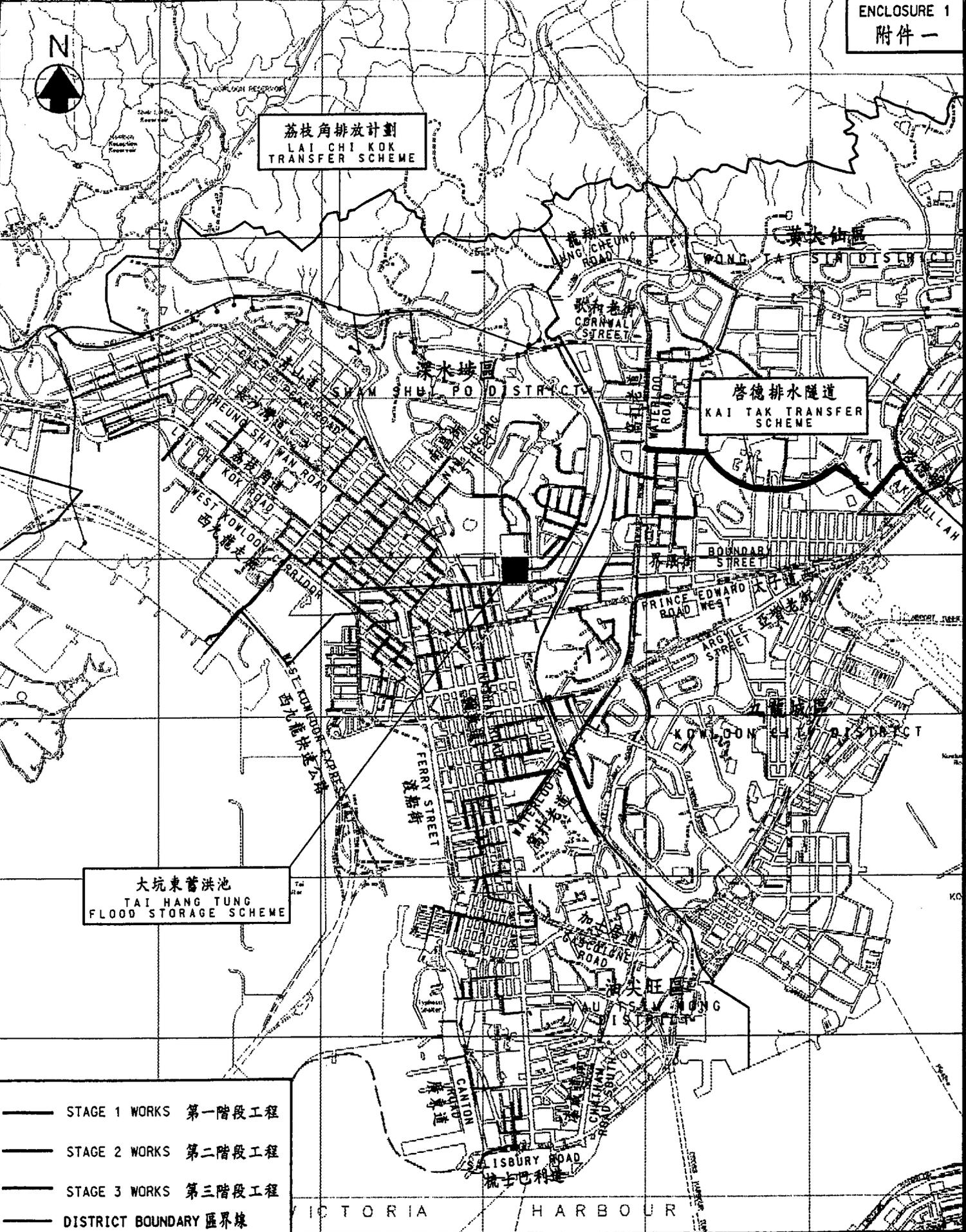


荔枝角排放計劃  
LAI CHI KOK  
TRANSFER SCHEME

塔德排水隧道  
KAI TAK TRANSFER  
SCHEME

大坑東蓄洪池  
TAI HANG TUNG  
FLOOD STORAGE SCHEME

- STAGE 1 WORKS 第一階段工程
- STAGE 2 WORKS 第二階段工程
- STAGE 3 WORKS 第三階段工程
- DISTRICT BOUNDARY 區界線



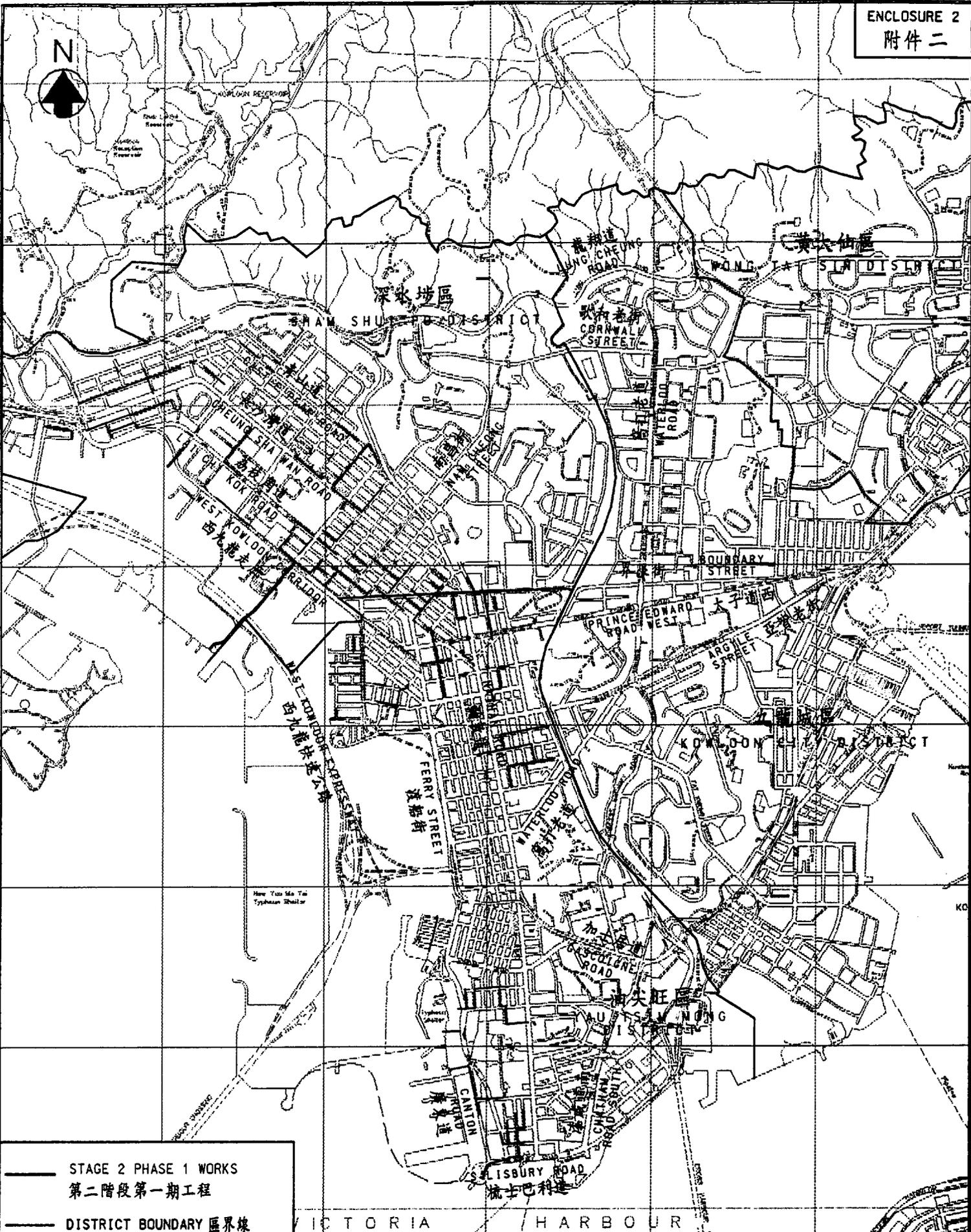
**D** DRAINAGE SERVICES  
DEPARTMENT 渠務署  
HONG KONG 香港

PROJECT MANAGEMENT  
DIVISION  
工程管理部

Project 項目名稱  
**AGREEMENT NO. CE99/96**  
**WEST KOWLOON DRAINAGE IMPROVEMENT - STAGE 2**  
**西九龍雨水排放系統改善工程第二階段**

Title 圖名  
**NEW DRAINAGE STRATEGY**  
**現建議的排水方案**

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Date 日期 04/99	Approved By 核註 Y.F. KAN
Scale 比例 1 : 30000	Figure No. 圖表編號 DPM/059CD/0001



— STAGE 2 PHASE 1 WORKS  
 第二階段第一期工程  
 — DISTRICT BOUNDARY 區界線

 <b>DRAINAGE SERVICES DEPARTMENT</b> 渠務署 HONG KONG 香港	Project 項目名稱 <b>AGREEMENT NO. CE99/96</b> <b>WEST KOWLOON DRAINAGE IMPROVEMENT - STAGE 2</b> <b>西九龍雨水排放系統改善工程第二階段</b>	Copyright Reserved © 版權所有	Drawn By 繪圖 <b>C.C. HO</b>
	Title 圖名 <b>STAGE 2 - PHASE 1 WORKS</b> <b>第二階段第一期工程</b>	Date 日期 <b>04/99</b>	Approved By 批准 <b>Y.F. KAN</b>
<b>PROJECT MANAGEMENT DIVISION</b> 工程管理部	Scale 比例 <b>1 : 30000</b>		

