

**Discussion Paper for Legislative Council
Panel on Planning, Lands and Works
Meeting on 23 April 2001**

- 92CD - Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1**
- 109CD - Drainage improvement in Sha Tin and Tai Po**
- 112CD - Drainage improvement in Northern New Territories – Package A**

INTRODUCTION

We intend to upgrade in May 2001 part of the Public Works Project Item **92CD** “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1” to Category A at an estimated cost of \$234.2 million in money-of-the-day (MOD) prices for construction of the phase 1 drainage improvement works in Yuen Long and Tin Shui Wai.

2. We also intend to upgrade in May 2001 parts of the following two Public Works Project Items to Category A for engagement of consultants at respective estimated costs of \$26.5 million and \$25.6 million in MOD prices for investigations, impact assessments and design of the proposed drainage improvement works:

109CD - Drainage improvement in Sha Tin and Tai Po

112CD - Drainage improvement in Northern New Territories – Package A

3. This paper is to brief Members of the background and details of the proposed drainage improvement works under **92CD** and the proposed consultancies under **109CD** and **112CD**.

BACKGROUND

4. The existing drainage systems in some areas in Northern and Northwestern New Territories were built many years ago to meet the flow requirements at that time. As a result of continuing land development in these areas, the existing streamcourses and drainage systems no longer have adequate

capacity to meet the increased runoff, and the affected areas are therefore susceptible to flooding.

5. To meet the community's increased expectations for higher flood protection standard and to tackle the flooding problems in these areas, we commissioned a series of drainage master plan studies to examine the adequacy of the existing streamcourses and drainage systems and develop drainage improvement measures to meet required flood protection standard and future development needs.

Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai

6. We commissioned a drainage master plan study for Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai in January 1996 and completed it in December 1998. It recommended a programme of drainage improvement works to be implemented in two stages to tackle the flooding problems in the areas. In September 1998, we included the proposed stage 1 improvement works in Category B as **92CD** "Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1". The estimated total cost of stage 1 works is about \$517 million at September 2000 prices.

7. In view of the land acquisition requirements, we will carry out the stage 1 drainage improvement works into two phases. To bring earlier improvement, we will start the phase 1 works first which do not require acquisition of private lands.

8. Phase 1 covers drainage improvement works in Yuen Long and Tin Shui Wai. We have substantially completed the detailed design and plan to start construction in December 2001 for completion in May 2005. Design for phase 2 works is being carried out covering drainage improvement works in Kam Tin and Ngau Tam Mei.

9. Stage 2 comprises drainage improvement works for streamcourses in rural and undeveloped areas in Kam Tin, Ngau Tam Mei and Tin Shui Wai. Planning for the improvement works is underway and the works will be carried out in pace with future developments.

Sha Tin and Tai Po

10. We commissioned a drainage master plan study in Sha Tin and Tai Po in January 1998 and completed it in October 1999. It recommended a programme of drainage improvement works to tackle the flooding problems in the areas. In September 2000, we upgraded the proposed improvement works to

Category B as **109CD** "Drainage improvement in Sha Tin and Tai Po". The estimated project cost is about \$451 million at September 2000 prices.

11. We plan to start the site investigation, impact assessments and design in November 2001 for completion in April 2006 and start the construction in October 2004 for completion in October 2008.

Northern New Territories

12. We commissioned a drainage master plan study in Northern New Territories in October 1997 and completed it in October 1999. It recommended a three-stage programme (namely packages A, B and C) of drainage improvement works to tackle the flooding problems in the areas.

13. In September 2000, we upgraded the proposed Package A improvement works to Category B as **112CD** "Drainage improvement in Northern New Territories - Package A". Package A covers the drainage improvement works tackling the flooding problem in the higher risk areas in San Tin North, Fanling and Sheung Shui. The estimated project cost is about \$710 million at September 2000 prices. We plan to start the site investigation, impact assessments and design for Package A works in October 2001 for completion in April 2006, and to start the construction in October 2004 for completion in October 2008.

14. Packages B and C cover the drainage improvement works in San Tin South, Kwu Tung, Ma Tsao Lung, Fu Tei Au, Ta Kwu Ling, Man Uk Pin, Lung Yeuk Tau and Lin Ma Hang. Feasibility studies for these two packages of works are now in progress.

PROJECT SCOPE

92CD - Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1

15. The scope of the phase 1 works we propose to part upgrade under **92CD** comprises drainage improvement works in the areas in Yuen Long and Tin Shui Wai including Yuen Long Town, Ping Shan and Hung Shui Kiu as follows -

- (a) construction and rehabilitation of stormwater drains of about 7.8 kilometres in length ranging from 300 millimetres to 1800 millimetres in diameter in Yuen Long Town, Ping Shan and Hung

Shui Kiu areas by open-cut method;

- (b) construction of stormwater drains of about 35 metres in length of 1800 millimetres in diameter underneath the Light Rail Transit near Hung Uk Tsuen in Ping Shan by trenchless method;
- (c) construction of a single cell box culvert of about 35 metres in length at Tan Kwai Tsuen in Hung Shui Kiu; and
- (d) replacement of about 5 kilometres in length of the existing metal handrails with concrete parapet wall of about 1 metre in height along the banks of the Hung Shui Kiu Channel and Ha Tsuen Channel.

16. A site plan showing the location of the proposed phase 1 works is at **Enclosure 1**.

109CD – Drainage improvement in Sha Tin and Tai Po

17. **109CD** comprises the following works -

- (a) construction of about 5 kilometres of drainage channels for Lam Tsuen River, She Shan River, Tai Po River and Kwun Hang River;
- (b) upgrading of about 8 kilometres of stormwater drains in urban areas of Sha Tin and Tai Po; and
- (c) construction of two floodwater pumping stations and other minor drainage facilities.

18. Site plans showing the locations of the proposed works are at **Enclosure 2**.

19. We propose to part-upgrade **109CD** to Category A for the engagement of consultants to carry out -

- (a) site investigation and surveys;
- (b) impact assessments; and
- (c) preliminary and detailed design, including preparation of tender documents and assessment of tenders.

112CD – Drainage improvement in Northern New Territories – Package A

20. **112CD** comprises the following works -
- (a) construction of about 7 kilometres of drainage channels in San Tin, Fanling and Sheung Shui; and
 - (b) upgrading and rehabilitation of about 12.5 kilometres of stormwater drains in urban areas of Fanling and Sheung Shui.
21. Site plans showing the location of the proposed works are at **Enclosure 3**.
22. We propose to part-upgrade **112CD** to Category A for the engagement of consultants to carry out -
- (a) site investigation and surveys;
 - (b) impact assessments; and
 - (c) preliminary design.

JUSTIFICATION

23. Owing to rapid urbanization and changes in land use over the years, more and more natural ground has been paved over and has become impermeable, leading to significant increase in surface runoff and thus overloading the existing streamcourses and drainage systems. The conversion of some of the farmland and fish ponds to open storage yards in the Northern and North-western districts has further reduced the capacity for storing rainwater in the areas and aggravated the flooding problems. Many areas in Yuen Long, Kam Tin, Ngau Tam Mei, Tin Shui Wai, Sha Tin, Tai Po and Northern New Territories are therefore susceptible to flooding during heavy rainstorms.

24. We have carried out a series of drainage master plan studies to assess the adequacy of the existing drainage systems, rivers, channels and streamcourses in the New Territories and formulate drainage improvement measures to upgrade the flood protection level in these areas to meet the increasing public expectation and development needs. Upon completion of

these drainage improvement works, the flood protection level in the concerned areas will be brought up to the required standard and the risk of flooding during heavy rainstorms will be substantially reduced.

25. For drainage improvement works in Sha Tin, Tai Po under **109CD** and in the Northern New Territories under **112CD**, owing to the lack of in-house staff resources, we propose to employ consultants to carry out the following tasks-

109CD - site investigation, surveys, impact assessments, preliminary and detailed design, preparation of tender documents and assessment of tenders

112CD - site investigation, surveys, impact assessments and preliminary design

FINANCIAL IMPLICATIONS

26. We estimate the project cost of the proposed phase 1 works under **92CD** to be \$234.2 million (in MOD prices). We also estimate the costs of the proposed consultancies under **109CD** and **112CD** to be \$26.5 million and \$25.6 million (in MOD prices) respectively. Cost breakdowns are at **Enclosure 4**.

27. A breakdown by man-month of the estimates for the consultants' fees under **92CD**, **109CD** and **112CD** is also at **Enclosure 5**.

PUBLIC CONSULTATION

92CD - Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1

28. We consulted the Ping Shan Rural Committee and Ha Tsuen Rural Committee on 5 December 2000 for the proposed works. We also consulted the Town Planning and Development Sub-committee of the Yuen Long District Council on 17 January 2001. They supported the implementation of the proposed drainage improvement works.

109CD – Drainage improvement in Sha Tin and Tai Po

29. We presented the findings and recommendations of the drainage master plan study in Sha Tin and Tai Po to the Health and Environment Committee of the Sha Tin District Council on 4 January 2001 and the Environment and Works Committee of the Tai Po District Council on 12

January 2001. Both supported the implementation of the proposed drainage improvement works.

112CD – Drainage improvement in Northern New Territories – Package A

30. We presented the findings and recommendations of the drainage master plan study in the Northern New Territories in respect of the Package A works under **112CD** to Yuen Long District Council on 14 December 2000, North District Council on 9 January 2001 and Tai Po District Council on 12 January 2001. All supported the implementation of the proposed drainage improvement works.

ENVIRONMENTAL IMPLICATIONS

Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1 phase 1 works under 92CD

31. **92CD** is not a designated project under Environmental Impact Assessment (EIA) Ordinance. We completed the Environmental Study (ES) for the proposed works in March 2001. The ES concluded that there would be no long term environmental impacts exceeding established criteria. We will incorporate into the works contract to require the contractor to carry out the recommended environmental mitigation measures¹ to control pollution during construction. We estimate the cost of implementing the environmental mitigation measures to be \$1.5 million in September 2000 prices. We have included this in the project estimates.

32. We estimate that about 154,000 cubic metres (m³) of construction and demolition materials (C&DM) will be generated by the project. Of these C&DM, about 123,200 m³ (80%) will be reused on site, 29,260 m³ (19%) will be reused as fill in public filling areas and 1,540 m³ (1%) of the construction waste will be disposed at landfills. We have considered in the planning and design stage ways of reducing the generation of C&DM as far as possible.

33. We will encourage the contractors to use steel instead of timber in formwork and temporary works to reduce the generation of waste. We shall require the contractor under the contract to submit a waste management plan to the Engineer for approval, with appropriate mitigation measures, including the allocation of an area for waste segregation. We shall ensure that the day-to-day operations on site comply with the waste management plan. We shall require

¹ The measures will include frequent watering of the site and the provision of wheel-washing facilities to reduce emission of fugitive dust, the use of silenced construction plant to reduce noise generation and other procedures as recommended in the Environmental Study.

the contractor to implement necessary measures to minimize the generation of C&DM and to reuse C&DM as fill material as far as possible. We will control disposal of C&DM and waste to public filling areas and landfills respectively through a trip-ticket system. We will record the disposal and reuse of C&DM for monitoring purposes.

Consultancies for drainage improvement in Sha Tin and Tai Po under 109CD and in Northern New Territories under 112CD

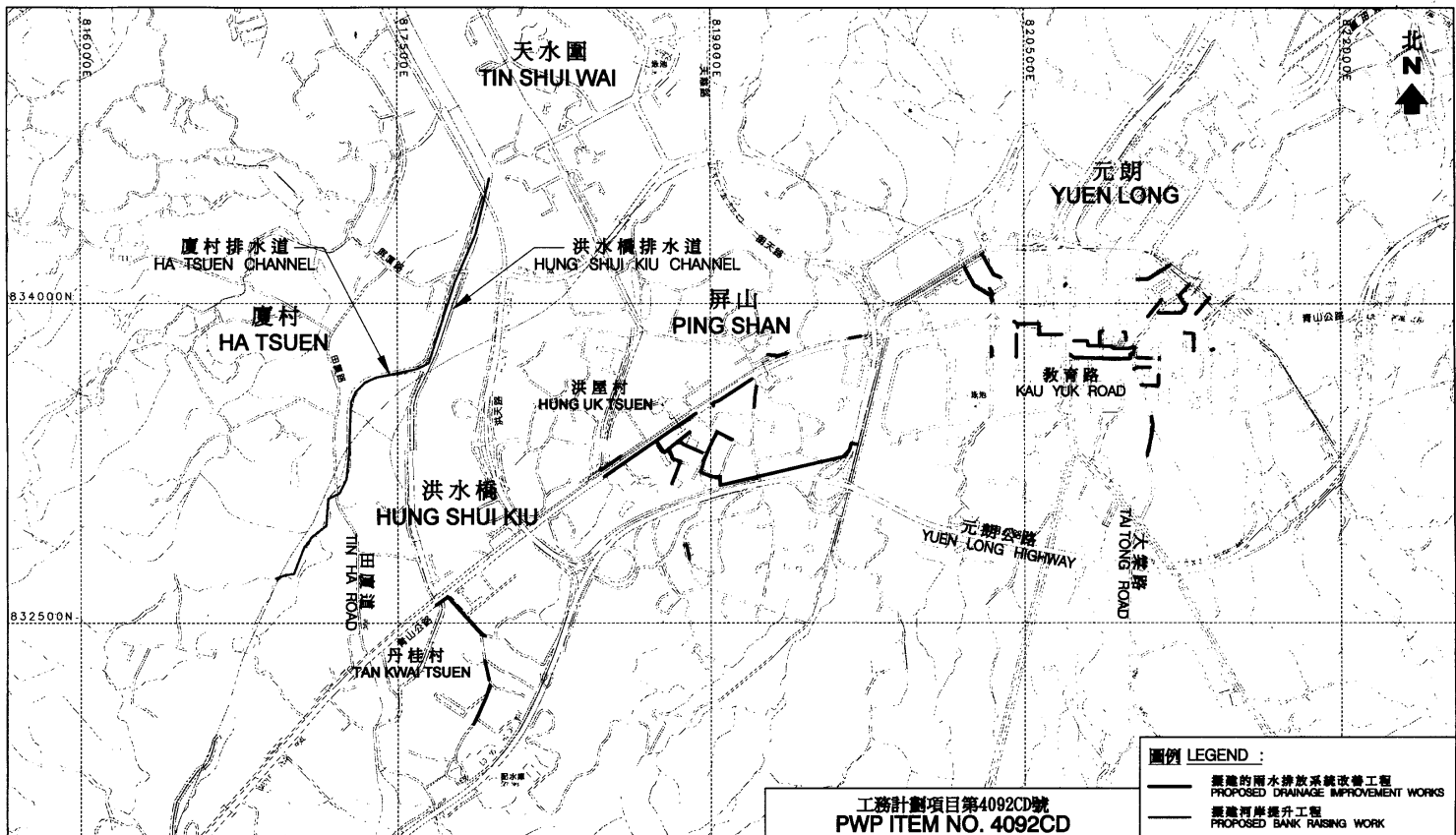
34. The proposed consultancies will not generate any C&DM while the proposed site investigation works will only generate a very small amount of C&DM. For the future implementation of the construction projects, we will require the consultants to fully consider measures to minimise the generation of C&DM and to reuse/recycle C&DM as much as possible.

35. Part of **109CD** and **112CD** are classified as designated projects under Schedule 2 of the EIA Ordinance. Environmental permits will be required for these two projects. We will carry out EIA studies to assess the environmental impacts of the projects and prepare EIA reports to meet the requirements under the EIA Ordinance. We will incorporate all the measures recommended in the EIA study reports into the detailed design and relevant works contracts.

LAND ACQUISITION

36. The proposed works under **92CD** and the proposed consultancies under **109CD** and **112CD** that we propose to part-upgrade to Category A do not require land acquisition.

Works Bureau
April 2001



圖例 LEGEND :

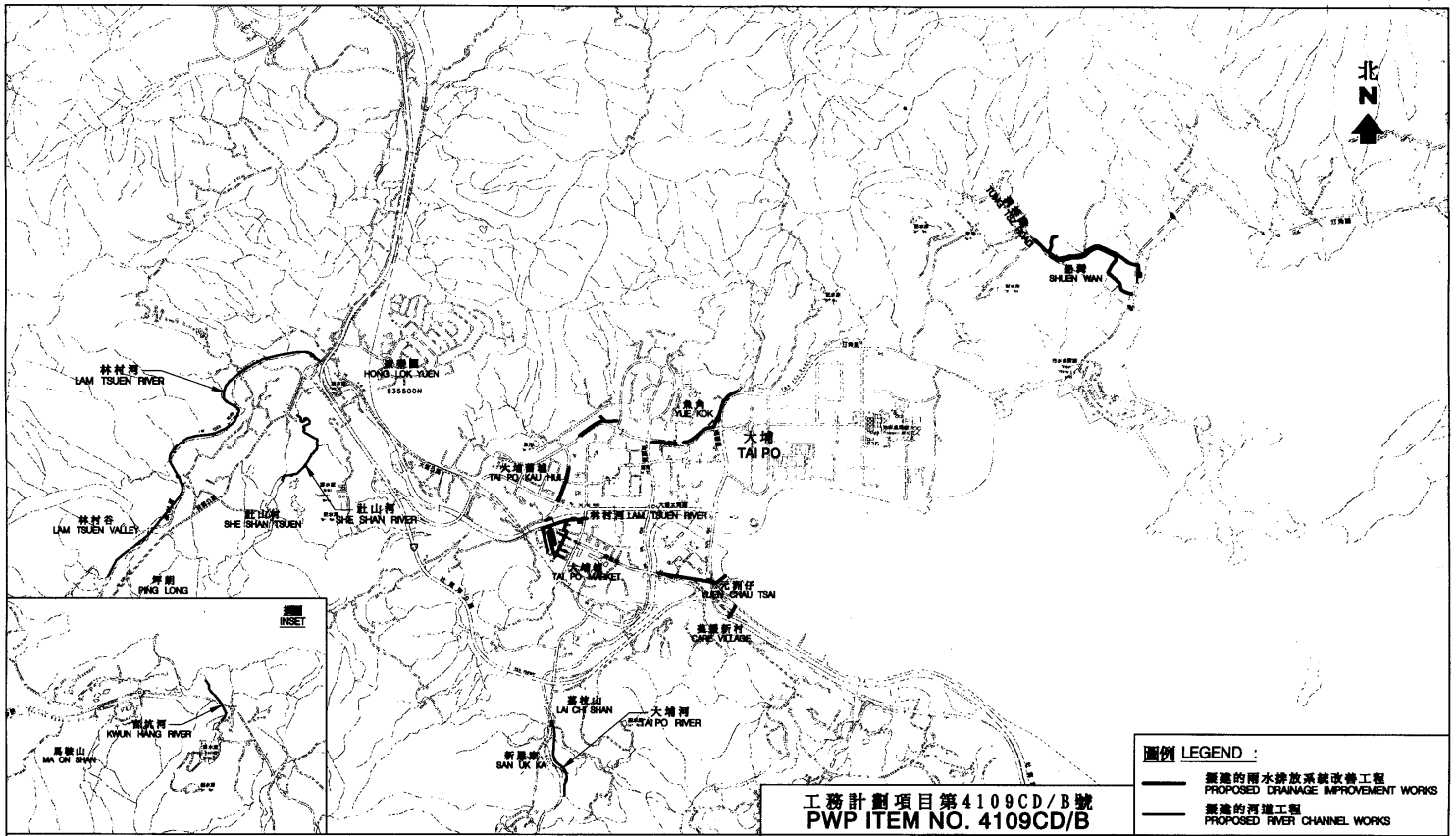
- 擬議的雨水排放系統改善工程
PROPOSED DRAINAGE IMPROVEMENT WORKS
- 擬議河岸提升工程
PROPOSED BANK RAISING WORK

工務計劃項目第4092CD號 PWP ITEM NO. 4092CD		圖則編號 drawing no.		比例	
繪畫 drawn	SIGNED C.W. CHAN	日期 date	03-04-2001		
核對 checked	SIGNED C.S. CHENG	日期 date	03-04-2001		
批准 approved	SIGNED C.M. CHUNG	日期 date	03-04-2001		
部門 office 工程管理部 PROJECT MANAGEMENT DIVISION		保·留·版·權 COPYRIGT RESERVED 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION			
		.DPM/0012		N.T.S.	

圖則名稱 drawing title

元朗及天水圍雨水排放系統改善工程的位置圖
**LOCATION PLAN OF YUEN LONG AND TIN SHUI WAI
 DRAINAGE IMPROVEMENT WORKS**

Enclosure 1
附件 1



圖則名稱 drawing title

大埔雨水排放系統改善工程的位置圖
LOCATION PLAN OF TAI PO DRAINAGE IMPROVEMENT WORKS

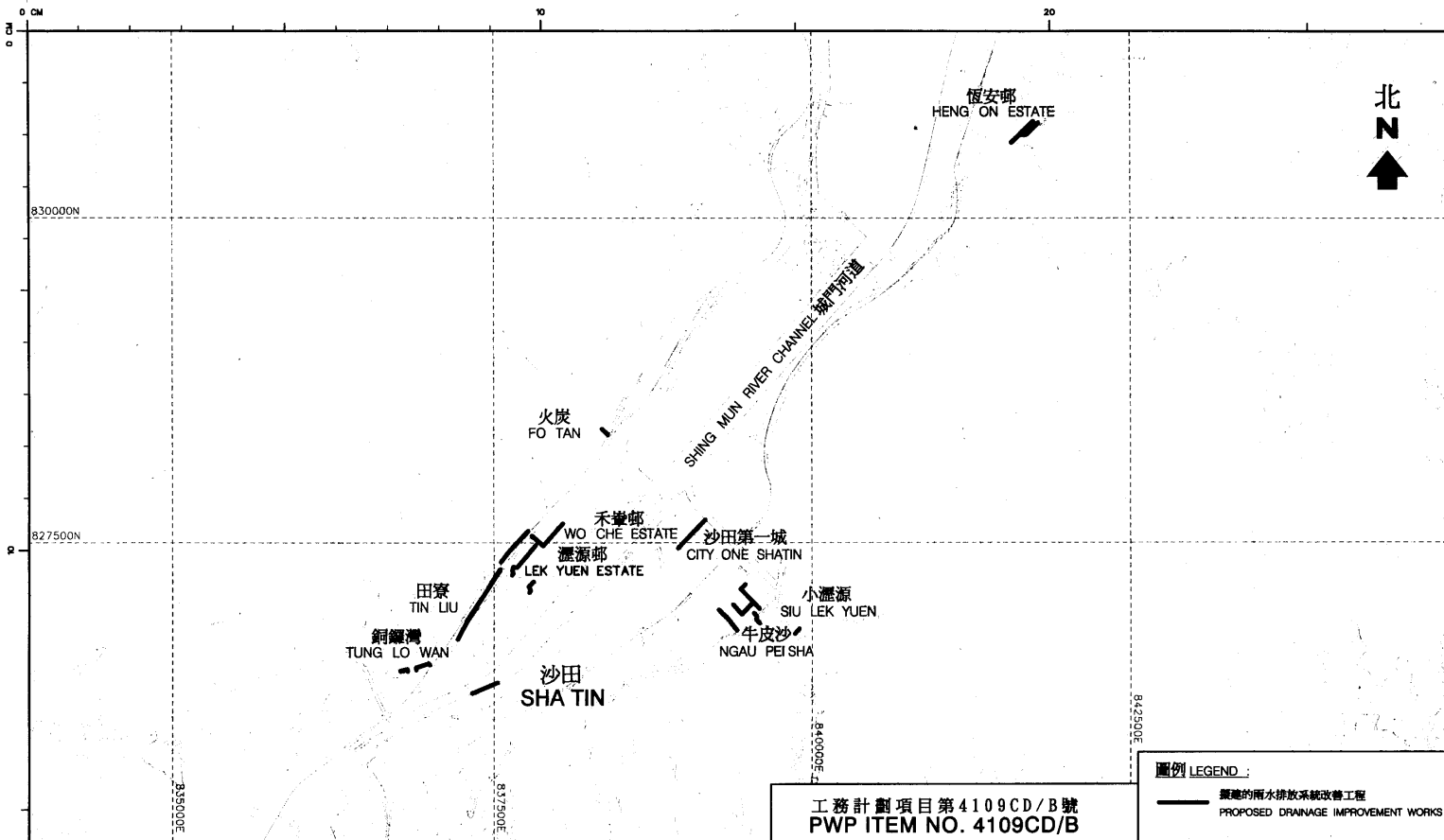
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核對 checked	SIGNED	C.H. WONG	日期 date 03-04-2001
批核 approved	SIGNED	C.H. WONG	日期 date 03-04-2001
部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION			

圖例 LEGEND :

- 擬議的雨水排放系統改善工程
PROPOSED DRAINAGE IMPROVEMENT WORKS
- 擬議的可導工程
PROPOSED RIVER CHANNEL WORKS

圖則編號 drawing no.	比例 scale
DCM/2001/040	N.T.S.
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Enclosure 2 附件2



圖例 LEGEND :
 擬建的雨水排放系統改善工程
 PROPOSED DRAINAGE IMPROVEMENT WORKS

工務計劃項目第4109CD/B號
PWP ITEM NO. 4109CD/B

圖則名稱 drawing title
 沙田雨水排放系統改善工程的位置圖
LOCATION PLAN OF SHA TIN DRAINAGE IMPROVEMENT WORKS

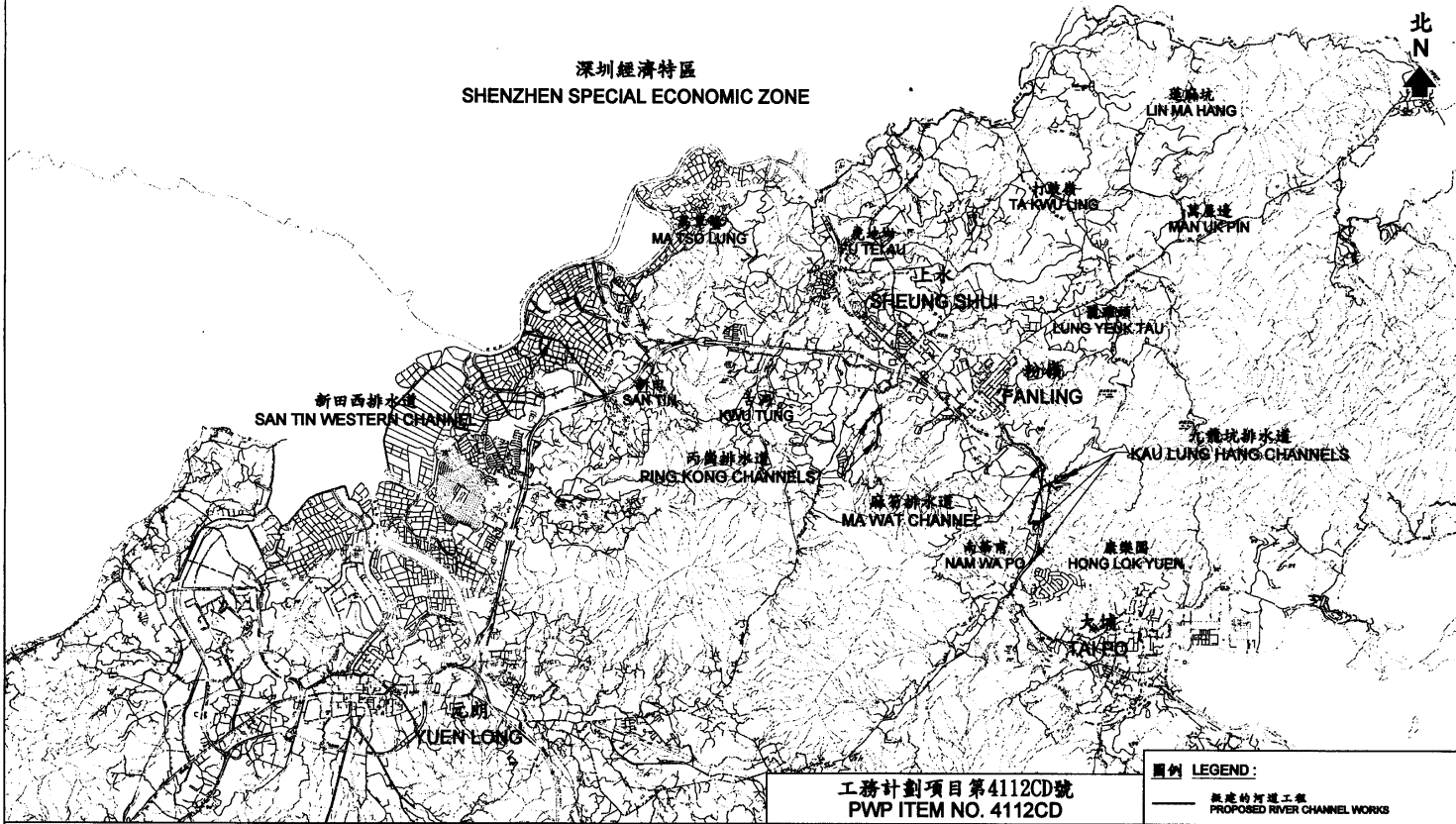
繪畫 drawn	SIGNED	T.C. CHAN	日期 date	15-2-2001
核對 checked	SIGNED	C.H. WONG	日期 date	15-2-2001
批核 approved	SIGNED	C.H. WONG	日期 date	15-2-2001
部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION				

圖則編號 drawing no.
DCM/2001/026
 比例 scale
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Enclosure 2 附件2

深圳經濟特區
SHENZHEN SPECIAL ECONOMIC ZONE



圖則名稱 drawing title

新界北部河道工程的位置圖
LOCATION PLAN OF NORTHERN NEW TERRITORIES
RIVER CHANNEL WORKS

工務計劃項目第4112CD號
PWP ITEM NO. 4112CD

繪畫 drawn	SIGNED	C.W. CHAN	日期 date	10-04-2001
核對 checked	SIGNED	S.C. MA	日期 date	10-04-2001
批准 approved	SIGNED	C.M. CHUNG	日期 date	10-04-2001
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION			

圖例 LEGEND:

擬定的河道工程
PROPOSED RIVER CHANNEL WORKS

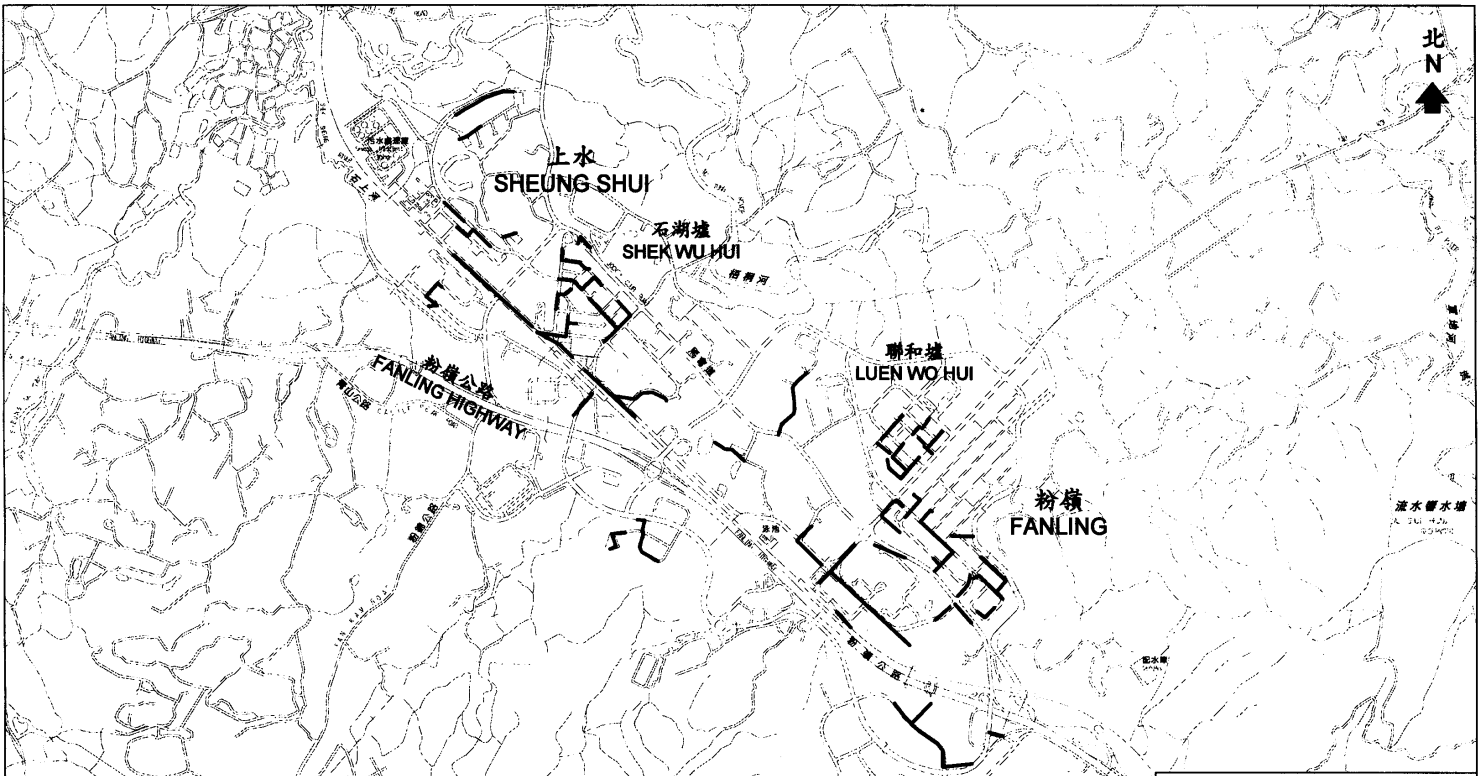
圖則編號 drawing no.
DPM/0010

比例 scale
N.T.S.

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Enclosure 3
附件3



圖則名稱 drawing title

新界北部雨水排放系統改善工程的位置圖
LOCATION PLAN OF NORTHERN NEW TERRITORIES
DRAINAGE IMPROVEMENT WORKS

工務計劃項目第4112CD號 PWP ITEM NO. 4112CD			
繪畫 drawn	SIGNED	C.W. CHAN	日期 date 10-04-2001
核對 checked	SIGNED	S.C. MA	日期 date 10-04-2001
批核 approved	SIGNED	C.M. CHUNG	日期 date 10-04-2001
部門 office 工程管理部 PROJECT MANAGEMENT DIVISION			

圖例 LEGEND:	
擬建的雨水排放系統改善工程 PROPOSED DRAINAGE IMPROVEMENT WORKS	
圖則編號 drawing no.	比例 scale
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Enclosure 3
附件 3

92CD - Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1

Cost breakdown of the proposed phase 1 works

	\$ million	
(a) Storm water drains	141.8	
(i) by open-cut method	135.7	
(ii) by trenchless method	6.1	
(b) Box culvert	1.8	
(c) Concrete parapet wall	23.5	
(d) Environmental mitigation measures	1.5	
(e) Consultants' fees for construction stage	1.4	
(f) Resident site staff cost	27.6	
(g) Contingencies	<u>15.1</u>	
Sub-total	212.7	(in September 2000 prices)
(h) Provision for price adjustment	<u>21.5</u>	
Total	<u>234.2</u>	(in MOD prices)

109CD – Drainage improvement in Sha Tin and Tai Po

Cost breakdown of the proposed consultancy

		\$ million	
(a)	Site investigation and surveys	7.1	
(b)	Consultants' fees -	14.9	
	(i) Supervision of site investigation and surveys	0.8	
	(ii) Environmental Impact Assessment	1.6	
	(iii) Traffic Impact Assessment	1.0	
	(iv) Water Gathering Ground Impact Assessment	0.5	
	(v) Preliminary design	3.2	
	(vi) Detailed design including preparation of tender documents and assessment of tenders	7.8	
(c)	Contingencies	<u>2.2</u>	
	Sub-total	24.2	(in September 2000 prices)
(d)	Provision for price adjustment	<u>2.3</u>	
	Total	<u>26.5</u>	(in MOD prices)

112CD – Drainage improvement in Northern New Territories – Package A

Cost breakdown of the proposed consultancy

	\$ million	
(a) Site investigations and surveys	14.1	
(b) Consultants' fees for –	7.4	
(i) Supervision of site investigations and surveys	1.4	
(ii) Traffic impact assessment	1.1	
(iii) Environmental impact assessment	2.5	
(iv) Water-main impact assessment	0.6	
(v) Heritage impact assessment	0.6	
(vi) Preliminary design	1.2	
(c) Contingencies	<u>2.2</u>	
	Sub-total	<u>23.7</u> (in September 2000 prices)
(d) Provision for price adjustment	<u>1.9</u>	
	Total	<u>25.6</u> (in MOD prices)

- 92CD - Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1**
109CD - Drainage improvement in Sha Tin and Tai Po
112CD - Drainage improvement in Northern New Territories – Package A

Breakdown of estimates for consultants' fees -

Consultants' staff costs		Estimated man months			Average MPS salary point	Multiplier factor	Estimated fee (\$ million)		
		92CD	109CD	112CD			92CD	109CD	112CD
(a) Supervision of site investigation and surveys	Professional	N.A.	5	8	38	1.7	N.A.	0.5	0.8
	Technical		9	17	14	1.7		0.3	0.6
(b) Impact assessments including environmental, traffic, water gathering ground, water-mains and heritage	Professional	N.A.	16	25	38	2.4	N.A.	2.2	3.5
	Technical		20	29	14	2.4		0.9	1.3
(c) Preliminary design	Professional	N.A.	14	7	38	2.4	N.A.	1.3	1.0
	Technical		28	4	14	2.4		1.9	0.2
(d) Detailed design including preparation of tender documents and assessment	Professional	N.A.	36	N.A.	38	2.4	N.A.	5.0	N.A.
	Technical		62		14	2.4		2.8	
(e) Consultants' fees for construction stage	Professional	6	N.A.	N.A.	38	2.4	0.8	N.A.	N.A.
	Technical	13			14	2.4	0.6		

		Estimated man months			Average MPS salary point	Multiplier factor	Estimated fee (\$ million)			
		92CD	109CD	112CD			92CD	109CD	112CD	
Consultants' staff costs										
(f)	Site supervision by resident site staff employed by consultants	Professional Technical	90 580	N.A.	N.A.	38 14	1.7 1.7	8.8 18.8	N.A.	N.A.
Total consultants' staff costs							29.0	14.9	7.4	
Out-of-pocket expenses										
(a)	Site investigation and surveys							N.A.	7.1	14.1
Total out-of-pocket expenses							N.A.	7.1	14.1	

Notes:

1. A multiplier factor of 2.4 is applied to the average MPS points to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices (At 1.4.2000, MPS pt. 38 = \$57,525 per month and MPS pt. 14 = \$19,055 per month). A multiplier factor of 1.7 is applied in case of site staff supplied by the consultants.
2. Out-of-pocket expenses are the actual cost incurred. The consultants are not entitled to any additional payment for overheads or profit in respect of these items.
3. The figures given above are based on estimates prepared by the Director of Drainage Services. We will only know the actual man months and actual fee when we have selected the consultants through the usual competitive lump sum fee bid system.