Information Paper for LegCo
Panel on Planning, Lands and Works
Meeting on 18 May 2000

Flood Control and Prevention

INTRODUCTION

This paper provides Members with a general update of flood control and prevention measures, a brief account of the flooding incidents on 14 April 2000 and our findings on the causes of the serious flooding in Yuen Long and Tuen Mun. Measures taken or contemplated to tackle the problem are also described.

UPDATE OF FLOOD CONTROL AND PREVENTION MEASURES

2. The Government is actively implementing a series of major flood control projects to tackle the flooding problem throughout the Territory. The following is a brief description of the achievement so far and the present status of major projects under Public Works Programme (PWP) being planned or constructed by both Drainage Services Department (DSD) and Territory Development Department (TDD). The status of these PWP items are listed in **Appendix A** and their locations are shown in the **Appendix B**.

a) North Western New Territories:

Over 18 km of drainage channels and 11 village flood protection schemes have been constructed in the Yuen Long, Tin Shui Wai, San Tin and Kam Tin areas. Major flood control projects currently under construction include 11 km of drainage channels and the village flood protection scheme for Pok Wai. There are also projects under planning and design. They include 7 major

village flood protection schemes for villages at Ma Tin Tsuen, Shui Pin Tsuen, Shui Pin Wai, Tai Kiu, Wang Chau, Chuk Yuen Tsuen/Ha San Wai and Mai Po Lo Wai/Mai Po San Tsuen and 26 km of river channels comprising the Yuen Long Bypass Floodway, the upper reaches of the Kam Tin River and some other smaller channels.

(b) Northern New Territories:

Stage I of the Shenzhen River Regulation Project, the most critical flood mitigation project in the Northern New Territories, was completed in April 1997. The Stage II works will be completed by the end of 2000 and the Stage III works is scheduled to start in 2001 for completion in 2005.

Two village flood protection schemes have been completed. They are in Sheung Shui Tsuen and Tsung Pak Long/Tai Tau Leng villages. Major drainage channels currently under construction include 18 km of drainage channels in River Indus and River Beas areas. Another 1.6 km of river channels are under planning and design to improve the lower River Ganges.

(c) West Kowloon

The drainage improvement works at Nathan Road between Boundary Street and Nullah Road have been completed to provide initial relief to the flooding in Mong Kok. Further drainage improvement works under Stage 1 of the West Kowloon Drainage Improvement Scheme have progressed well since commencement in April 1998. They include laying of about 10 km of stormwater drains in Yau Ma Tei, Kowloon Tong, Sham Shui Po and Lai Chi Kok for completion in 2003. Under Stage 2, two contracts were awarded in November 1999 and February 2000 respectively. They include improvement of 23 km of stormwater drains in West

Kowloon for completion in 2004. Moreover, planning and design for the Tai Hang Tung Flood Storage Scheme and the Kai Tak Stormwater Transfer Scheme under Stage 2 is underway. Construction is scheduled to start in 2001 for completion in 2004.

3. Interim improvement and maintenance measures are in place to help alleviate the flooding problem before the completion of the long-term improvement measures. Local drainage improvements have been implemented to provide initial relief to some of the flooding problems. They include various drainage works under the Rural Planning and Improvement Strategy (RPIS) programme in the New Territories and the relief drains and roadside U-channels in Mong Kok.

4. For the day-to-day flood prevention management, DSD will inspect, desilt and repair the stormwater drainage system regularly before and during the rainy season to ensure that any blockages and defects will be cleared and rectified. At locations where flooding may cause high risks to the general public, flow gauges and flood warning systems (flood sirens) have been installed to monitor the flooding situations and alert the local residents about the arrival of floodwater. There is also a list of flooding blackspots compiled to facilitate the deployment of resources to carry out immediate relief measures when adverse weather comes. DSD will closely liaise with other relevant Government departments and personnel in charge of construction sites to avoid flooding due to blockage of roadside gullies, drains or watercourses by rubbish or construction waste. A television announcement is broadcast from time to time soliciting for the support of the public to keep the drainage system from blockage.

5. Although there will still be flooding during severe rainstorms before the completion of all the major flood control projects, previously completed drainage projects have been proven to be effective in alleviating some of the flooding problems. The following examples are quoted:

(a) The recently completed San Tin Flood Pumping Scheme has protected the seven villages in the San Tin area during the recent flooding on 14 April 2000. The other 17 completed flood pumping schemes have been proven to protect the low-lying villages well under previous rainstorms.

(b) The completion of the Yuen Long Main Drainage Channel has also resolved the flooding problems in the lower to mid stream of the Shan Pui River and enables the flood water in the upstream areas including Yuen Long Town to subside quickly after rainstorms have ceased. This is in contrast with the long flood duration experienced before the construction of the channel.

(c) The regulation of the Shenzhen River has been effective in lowering the water level at Lo Wu by more than 1 m which alleviates the flooding problem in the North District to a certain extent. The benefits will become more apparent upon the completion of major river improvement works in the North District.

6. The Government has put in a lot of effort to tackle the flooding problems and will continue to do so. Major flood control projects are being planned and constructed although these projects often take many years to complete due to the time needed to carry out design and construction, public consultation, land resumption and clearance, assessment of environmental, traffic and utilities impacts and to meet procedural requirements under relevant ordinances. Upon completion of these projects, we believe that our drainage system will provide much better protection against severe rainstorms and prevent recurrence of widespread regional flooding.

FLOODING IN NORTH WESTERN NEW TERRITORIES ON 14 APRIL

7. Rain bands associated with a trough of low pressure caused exceptionally heavy rainfall to the northwestern part of Hong Kong in the early morning of 14 April 2000. Severe flooding was reported in the Yuen Long and Tuen Mun areas. Flooding was also reported at most flooding blackspots in North District, such as Ho Sheung Heung, Tin Ping San, Ko Po, etc., but the flooding situation was not severe as compared to previous flooding incidents because the rainfall in the North District was not as intense as in the North Western New Territories (NWNT). As a result of the heavy rainfall, a total of 128 flooding complaints were received and 115 of them were in the New Territories.

Discharge from Shenzhen Reservoir

8. Water was discharged from the Shenzhen Reservoir to the Shenzhen River. The discharge rate was relatively small at the beginning but was increased after 10:30 am on 14 April 2000 when the intensity of rainfall in the Northern New Territories had reduced and the tide began to recede. Hence, the effect due to the discharge on the flooding situation in North District was insignificant. The discharge had no impact on the flooding in the Yuen Long and Tuen Mun areas because their drainage systems discharge to Deep Bay and Castle Peak Bay instead of the Shenzhen River.

Rainfall and Tide Records

9. The total rainfall recorded in the NWNT was up to 430 mm in the morning of 14 April 2000. The rainfall had a return period of about 35 years at Yuen Long and 15 years at Tuen Mun. The periods of the intense rainfall coincided with a high tide of +1.80 mPD which aggravated the flooding situation.

10. The occurrence of such heavy rainstorms in early April is very rare. In Yuen Long, 75 mm of rain was recorded in a one hour period. This is higher than that recorded at the Hong Kong Observatory at any time during early April since 1884.

Major Flooding Locations

11. There were 16 major flooding locations in the Yuen Long District and 3 in the Tuen Mun District, which are tabulated in the **Appendix C**. Brief descriptions of the extent and depth of flood, the causes of the flooding, the mitigation measures and the long term drainage improvement projects under PWP at each location are included in the table. The flooding locations in Yuen Long and Tuen Mun are shown on the plans in the **Appendix D1** and the **Appendix D2** respectively.

Findings on Causes of Flooding

12. The cause of the widespread flooding was mainly due to the inadequate capacity of the existing drainage systems to deal with such severe rainfall and the fact that there are many low-lying areas within the NWNT. Most of the major flooding occurred at known flooding blackspots or low-lying areas prone to flooding and the problem will be eliminated or alleviated by planned drainage improvement projects under PWP or local improvement works.

13. There are a few exceptions where flooding was not caused by inadequate drainage capacity or their low-lying topography. These exceptions are briefly discussed below:

(a) Tin Shui Wai Main Drainage Channel (YL2)

The Tin Shui Wai Main Drainage Channel has adequate hydraulic capacity to withstand the rainfall in this event. The temporary

earth bund within the drainage channel formed by TDD's contractor caused a certain rise in water level in the channel and consequently caused flooding to the footpath and cycle track within the channel. TDD's contractor has subsequently removed the temporary earth bund within the channel. There were allegations that the inflatable dam in the drainage channel had not been deflated, but site inspection at 10:00 am on 14 April 2000 and subsequent investigation indicated that the dam was operating normally during the event.

(b) Light Rail Transit along Lung Mun Road (TM2)

The drainage system in the area has adequate capacity and flooding rarely occurs. The flooding on 14 April 2000 was caused by serious blockage of the drainage system due to a mud slide originated from a natural slope area above a TDD site. Immediate action was taken to clear the blockage.

(c) Tsing Fat Street (TM3)

Flooding was caused by illegal earth filling of an existing open channel nearby. DSD had completed the clearance of the open channel and the Lands Department was requested to stop any illegal filling activities in the vicinity of the open channel.

14. According to our findings, we consider that the West Rail works being implemented by Kowloon-Canton Railway Corporation (KCRC) would not have directly caused the regional widespread flooding. The impact of the KCRC's West Rail works is discussed in the following paragraphs.

Assessment on the Impact of KCRC's West Rail Works

15. In the implementation of the West Rail project, it will be necessary for KCRC to construct viaduct piers, columns and foundations within several

drainage channels in the NWNT. To enable the construction of the West Rail works, DSD has allowed KCRC to carry out temporary works in Tuen Mun Nullah, Hung Shui Kiu Channel, and Yuen Long Nullahs during the dry season up until 20 April 2000. The alignment of the West Rail and the locations of the temporary works are shown in **Appendixes D1** and **D2**.

Tuen Mun Nullah

16. Inspection on site confirmed that the flood flow on 14 April 2000 was contained within the banks of the Tuen Mun Nullah. Although we consider that the water level in the nullah upstream of the West Rail temporary works would be increased, it would have little impact on the flooding situation in Tsz Tin Tsuen (TM1).

17. Tze Tin Tsuen is located in an area upstream of the Tuen Mun Nullah with village type houses built at different formation levels. Some low-lying areas were flooded with a depth of about 1 m. The main causes of flooding were due to the low-lying topography and inadequate drainage capacity to cater for the severe rainstorm. The drainage works under RPIS items TM004 and TM064, scheduled to start in December 2001 for completion in December 2003, will alleviate the flooding problem. Based on our findings, we consider that the flood depth of a small low-lying area near the junction of Tsz Tin Road and Tsing Lun Road was slightly increased due to a higher water level in the Tuen Mun Nullah caused by the West Rail temporary works. Flooding of the very much larger areas of higher ground in Tsz Tin Tsuen would not have been aggravated by the West Rail temporary works.

Hung Shui Kiu Channel

18. The West Rail temporary works at Hung Shui Kiu Channel, which is located immediately upstream of the Tin Shui Wai Main Drainage Channel, include the construction of a cofferdam on one side of the bank. It is considered that the water level upstream of the cofferdam had been increased slightly due to the temporary works. Water levels at flooded areas in the

vicinity of Shek Po Tsuen would also have been slightly increased but the major cause of the flooding there was due to inadequate capacity of the Hung Shui Kiu Channel at that location to cater for the severe rainstorm. The capacity of Hung Shui Kiu Channel and Ha Tsuen Channel will be increased under a Category B PWP item no. 4092CD.

Yuen Long Nullahs

19. The major cause of the flooding was due to the intensity of the 1 in 35 year rainstorm coupled with the inadequate capacity of the existing drainage system and the low-lying topography of the affected areas. The planned Yuen Long Bypass Floodway will alleviate the flooding problem at these flood prone areas. Inspection on site revealed that all the flood flows were contained within the banks of the Yuen Long Nullahs on 14 April 2000. The flood depth in the close proximity of KCRC's works at Castle Peak Road near Kei Tei (YL9) and at Tai Kiu Tsuen (YL10) could have been increased slightly due to KCRC's nearby temporary works. KCRC's contractor assisted in mitigating the flood situation at Tai Kiu Tsuen by providing pumps to reduce the flood level.

Sheung Cheung Wai

20. Sheung Cheung Wai (YL3) was seriously flooded on 14 April 2000. The major cause of the flooding was due to magnitude of the severe rainstorm and the low-lying topography. Although a flood pumping station has been completed and put into operation, a power failure occurred on 14 April 2000 which caused the operation of the pumps to cease during 8:03 am to 8:23 am. This could induce a slight transient rise of water level. The increase of the catchment area draining into Sheung Cheung Wai, part of the West Rail permanent works under construction on 14 April, likewise could induce a rise of water level. To tackle the flooding problem at Sheung Cheung Wai in the long term, we will review and implement further improvement works under PWP item no. 227CL.

MEASURES TAKEN OR TO BE TAKEN TO AVOID RECURRENCE

21. Mitigation measures as noted in **Appendix C** are in place to tackle the flooding problems revealed in this flooding event. However, it is noticed that construction works in the vicinity of major watercourses have caused some adverse effects on their hydraulic performance and aggravated the flooding situation.

22. We are aware of risks induced by works in the vicinity of major watercourses, and at present, all permanent and temporary works affecting major watercourses need to be checked and agreed by DSD. Resident engineering site staff employed by developers and the project offices will have to carry out day to day supervision to ensure that the works are carried out properly and in accordance with the agreed conditions.

23. As West Rail works will continue for some time, we will continue liaise closely with KCRC to ensure that they have good control on site to ensure that their contractors strictly follow the agreed conditions for carrying out the temporary works. DSD will also carry out regular visits to KCRC's sites to ensure that the works comply with the agreed conditions. This practice will also be applicable to works by other Government offices in drainage channels.

Works Bureau
May 2000

Appendix A

Major Flood Control Projects
Northwestern New Territories

PWP No.	Title	Estimated Construction Cost ($M)	Start Date	Completion Date
4064CD/B	Rural Drainage Rehabilitation Scheme - NWNT Portion	68	Early 03	Early 05
4092CD/B	Drainage Improvement in Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai, Stage 1	517	Late 01	Mid 06
4101CD/A	Rural Drainage Rehabilitation Scheme , Stage 2, Phase 1 - Nam Hang drainage improvement	17	Mid 00	Mid 02
7022CD/B	NWNT Development – Main Drainage Channels for Yuen Long and Kam Tin –remainder Phase 4 Stage 1 – Sham Chung Channel Phase 4 Stage 2 – Tin Tsuen Channel	 93 50	 Early 01 Late 02	 Early 03 Early 05
7029CD/A	NWNT Development - Main Drainage Channels for Ngau Tam Mei Phase 2 – Ngau Tam Mei to Yau Mei San Tsuen Section	 159	 Early 00	 Mid 02
7030CD/B	Village Flood Protection for Yuen Long, Kam Tin and Ngau Tam Mei - Stage I Chuk Yuen Tsuen/Ha San Wai Wang Chau – Phase 2 and Pok Wai – Stage 2 – Villages and Chau Tau Tsuen	 152 105	 Late 00 Early 02	 Early 03 Mid 04
7035CD/A	Main Drainage Channels for San Tin, NWNT Phase 1 Village Flood Protection Works for San Tin Phase 2 Village Flood Protection Works for Chau Tau	 148 57	 Late 96 Mid 97	 Late 99 Late 99
7043CD/A	NWNT Development - Main Drainage Channels for Yuen Long and Kam Tin Stage I Phase 2	357	Late 95	Late 98
7060CD/A	NWNT Development - Main Drainage Channels for Yuen Long and Kam Tin Stage I Phase 1	514	Late 93	Early 99
7070CD/B	Yuen Long Bypass Floodway	413	Late 02	Late 05
7071CD/A	Village Flood Protection for Sha Po Tsuen, Kam Tin, New Territories	97	Mid 96	Mid 99

Appendix A

PWP No.	Title	Estimated Construction Cost ($M)	Start Date	Completion Date
7073CD/B	Main Drainage Channels for San Tin, NWNT Phase 3, Part 1 - Eastern Main Drainage Channel for San Tin	240	Late 02	Early 05
7074CD/B	Village Flood Protection for Yuen Long, Kam Tin and Ngau Tam Mei - Stage II Mai Po Lo Wai/Mai Po San Tsuen Remainder Villages - Ma Tin, Shui Pin Wai, other local drainage works	 110 150	 Late 01 Late 01	 Late 04 Mid 05
7081CD/B	NWNT Development - Main Drainage Channels for Yuen Long and Kam Tin – remainder Phase 3	270	Mid 01	Late 03
7095CD/A	Main Drainage Channels for Yuen Long and Kam Tin Stage 2 – Kam Tin San Tsuen to Wang Toi Shan Section	319	Mid 99	Early 02
7097CD/A	NWNT Development - Main Drainage Channels for Yuen Long and Kam Tin–Stage 2 – Kam Tin Road to Tai Kek Section	312	Mid 99	Early 02
7098CD/A	Phase 1 Village Flood Protection for Pok Wai and Wang Chau, , NWNT	90	Late 99	Late 02
7100CD/A	Main Drainage Channels for Ngau Tam Mei Phase 1 - Yau Mei San Tsuen to Tai Sang Wai Section	403	Late 99	Late 02
7473CL/A	Village Flood Protection for Ha Mei San Tsuen	37	Mid 97	Late 98

Appendix A

Major Flood Control Projects
Northern New Territories

PWP No.	Title	Estimated Construction Cost ($M)	Start Date	Completion Date
4064CD/B	Rural Drainage Rehabilitation Scheme - River Ganges	100	Early 03	Early 05
4091CD/A	Rural Drainage Rehabilitation Scheme - River Indus	145	Late 98	Early 01
4093CD/A	Rural Drainage Rehabilitation Scheme - River Beas	150	Early 99	Mid 01
7053CD/A	River Training Works for the Upper River Indus	515	Mid 99	Early 02
7072CD/A	Village Flood Protection for Tsung Pak Long and Tai Tau Leng	80	Early 96	Late 98
7087CL/A	Shek Wu Hui Development Package 4, Engineering Works	308	Late 98	Early 01
7094CD/A	River Training Works for the Lower River Indus and River Beas	256	Early 99	Early 01
7651CL/A	Formation and Servicing of Area 36, Fanling, Phase 1	52	Early 99	Mid 01

Appendix A

Major Flood Control Projects
Shenzhen River

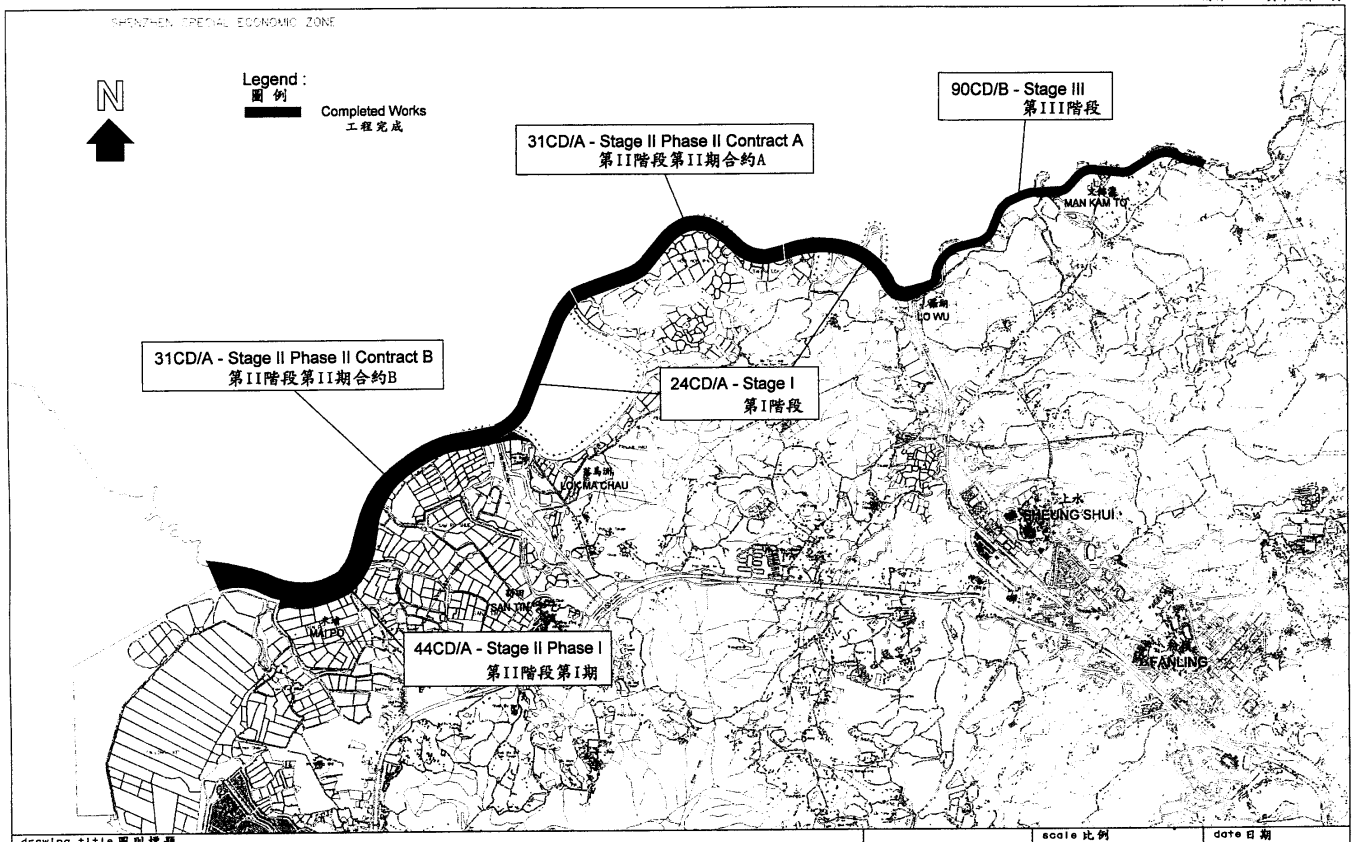
PWP No.	Title	Estimated Construction Cost ($M) (Note)	Start Date	Completion Date
4024CD/A	Shenzhen River Regulation Project Stage I	150 [300]	Mid 95	Early 97
4031CD/A	Shenzhen River Regulation Project Stage II Phase II Contract A (Upstream) Contract B (Downstream)	 104 [207] 245 [490]	 Mid 97 Late 97	 Mid 99 Late 00
4044CD/A	Shenzhen River Regulation Project Stage II Phase I (Advance Work)	145 [145]	Late 96	Late 98
4090CD/B	Shenzhen River Regulation Project Stage III	458 [839]	Late 01	Early 05

Note : Costs quoted are those shared by Hong Kong side; total construction cost in [ ];

Appendix A

Major Flood Control Projects
West Kowloon

PWP No.	Title	Estimated Construction Cost ($M)	Start Date	Completion Date
4059CD/B	West Kowloon Drainage Improvement Stage 2 Phase 2 Stage 3	} 2131	Early 01 Early 01	Early 04 Late 07
4089CD/A	West Kowloon Drainage Improvement – Stage I Works	464	Early 98	Early 03
4099CD/A	West Kowloon Drainage Improvement Stage 2 Phase 1 Works	1763	Late 99	Late 04



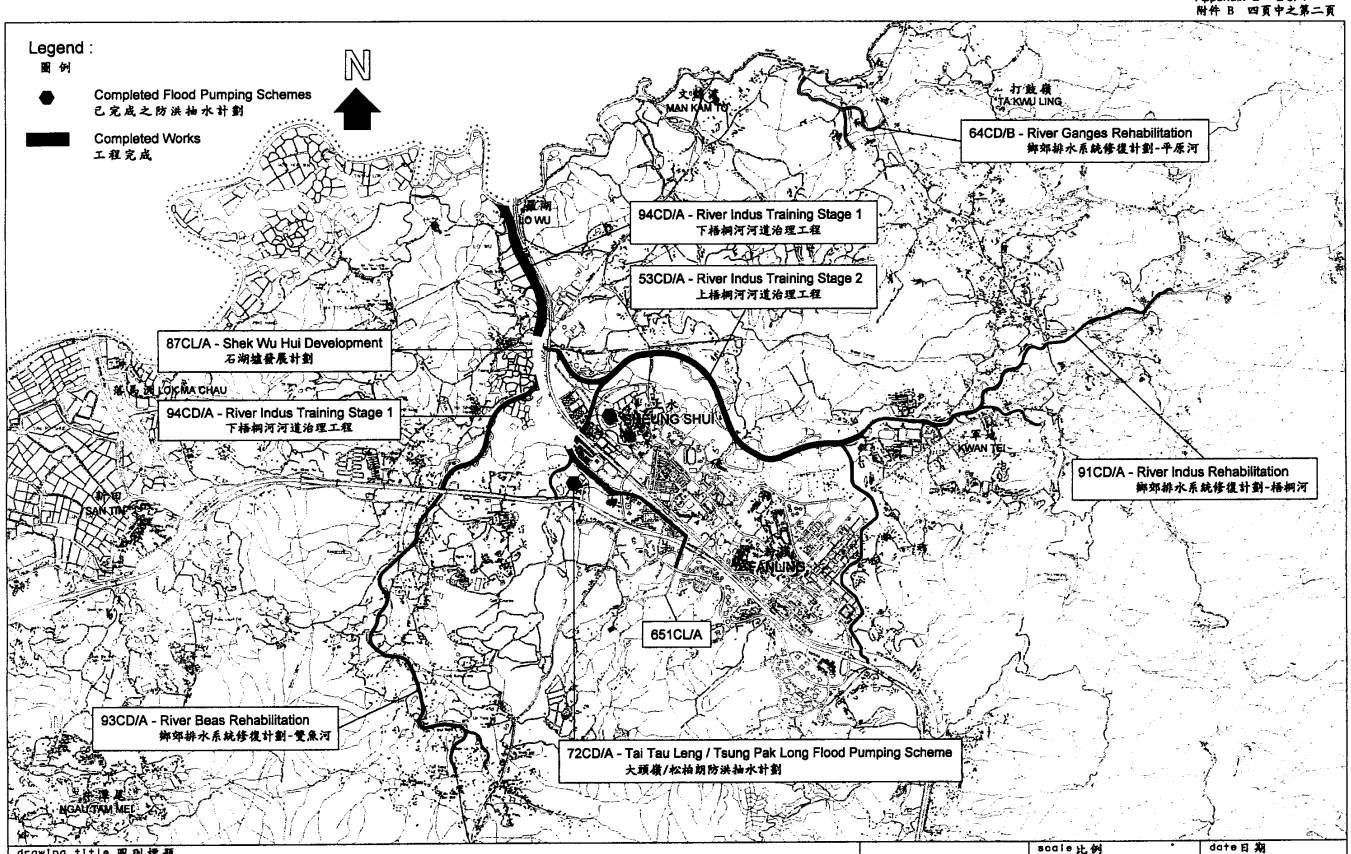
drawing title 圖則標題

Shenzhen River Regulation Project
深 圳 河 治 理 工 程

Appendix B 附件 B	scale 比例 1 : 50 000	date 日期 May 2000 2000年5月

office 部門
LAND DRAINAGE DIVISION
土 地 排 水 部

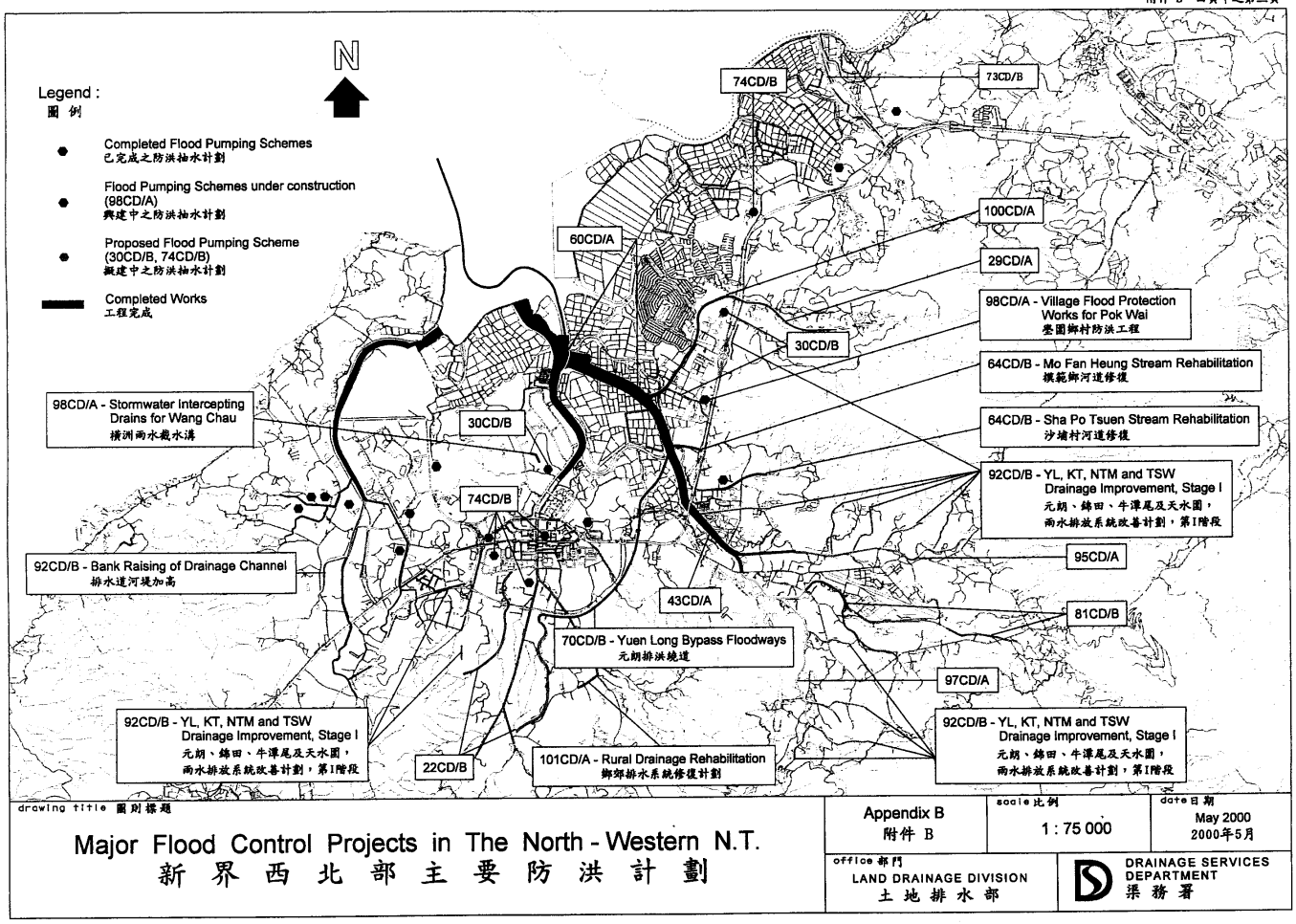
DRAINAGE SERVICES DEPARTMENT
渠 務 署



drawing title 圖則標題

Major Flood Control Projects in The Northern N.T.
新界北部主要防洪計劃

Appendix B 附件 B	scale 比例 1 : 50 000	date 日期 May 2000 2000年5月
office 部門 LAND DRAINAGE DIVISION 土地排水部	DRAINAGE SERVICES DEPARTMENT 渠務署	



drawing title 圖則標題

Major Flood Control Projects in The North - Western N.T.
新界西北部主要防洪計劃

Appendix B 附件 B	scale 比例 1 : 75 000	date 日期 May 2000 2000年5月
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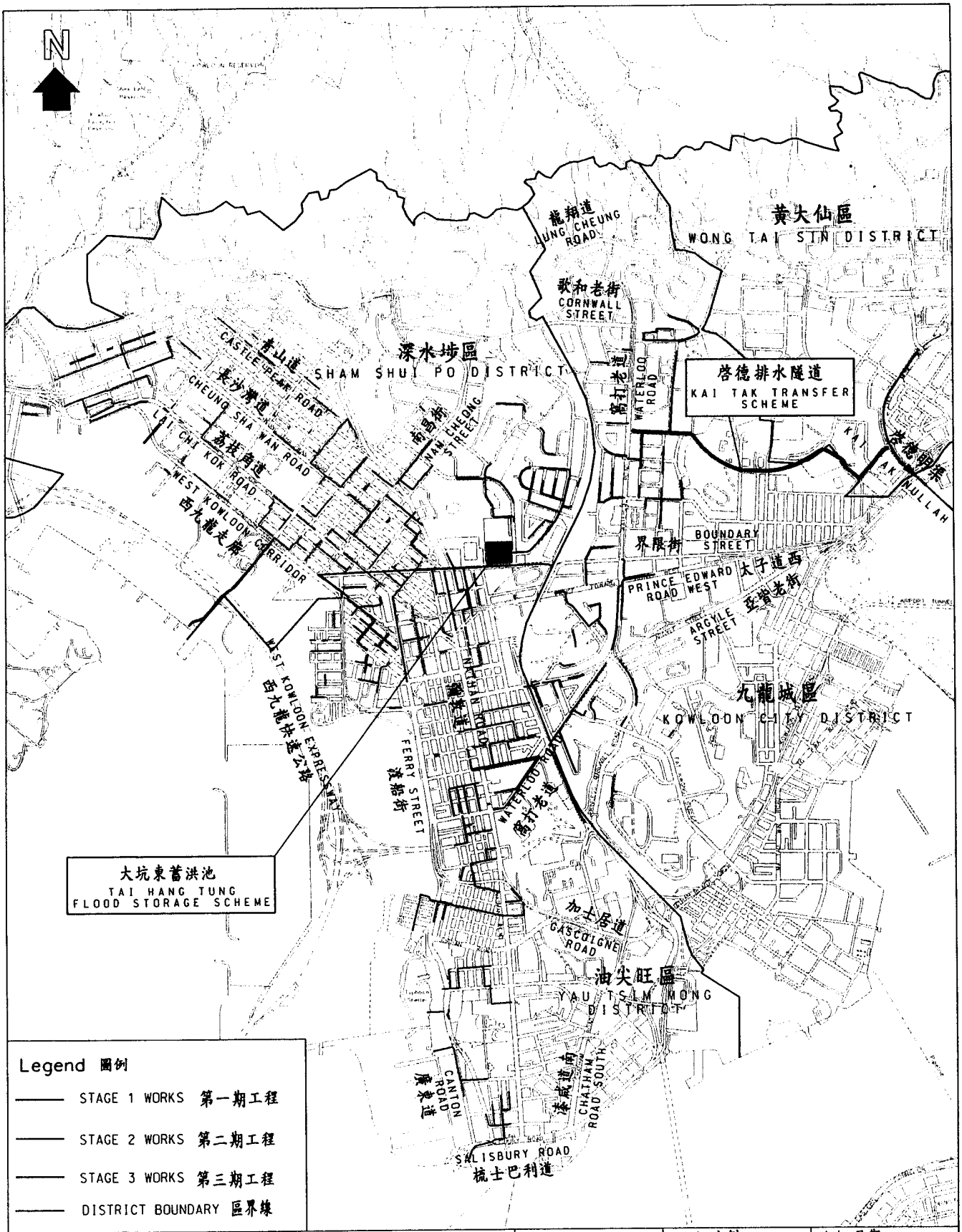


drawing title 圖則標題

Major Flood Control Projects in West Kowloon
西九龍主要防洪計劃

Appendix B 附件 B	scale 比例 1 : 30 000	date 日期 May 2000 2000年5月
office 部門 LAND DRAINAGE DIVISION 土地排水部	DRAINAGE SERVICES DEPARTMENT 渠務署	

Major Flooding Locations on 14 April 2000

DISTRICT	CODE No.	FLOODED AREA WITH BRIEF DESCRIPTION	CAUSES OF FLOODING	MITIGATION MEASURES	RELEVANT PWP ITEMS TO ALLEVIATE THE FLOODING SITUATION		
					ITEM	START DATE	FINISH DATE
YUEN LONG	YL1	**Tan Kwai Tsuen (near Tin Tei Yan Road) -** The village area was flooded. The flooded area was about 200m x 30m with a flood depth of 500mm.	This is a flooding blackspot. The capacity of the adjacent drainage channel is not adequate and is unable to cope with a 20-year return period rainstorm.	Widening of the drainage channel under RPIS at Tan Kwai Tsuen is in hand and is expected to be completed by September 2002.	Nil	-	-
	YL2	**Tin Shui Wai Main Drainage Channel -** Footpath and cycletrack along the channel bank was flooded. The flood depth varied from 250 mm to 1000 mm.	The temporary earth bund within the channel formed by TDD's contractor caused a certain rise in water level in the channel and caused flooding to the footpath and cycle track within the channel.	TDD's contractor has already removed the temporary earth bund within the channel.	Nil	-	-
	YL3	**Sheung Cheung Wai** - The flooded village area was 250 m x 80 m with a flood depth of 1300 mm.	The flooding was due to the severe rainstorm and low-lying topography. A power failure occurred on 14 April causing operation of flood protection pumping station to cease during 8:03 am to 8:23 am. The increase in catchment area, part of KCRC's permanent works, could induce a rise of water level.	Drainage works under 227CL will provide long term improvement.	227CL	Early 03	Late 05

Major Flooding Locations on 14 April 2000

DISTRICT	CODE No.	FLOODED AREA WITH BRIEF DESCRIPTION	CAUSES OF FLOODING	MITIGATION MEASURES	RELEVANT PWP ITEMS TO ALLEVIATE THE FLOODING SITUATION		
					ITEM	START DATE	FINISH DATE
YUEN LONG	YL4	**Long Bin Tsuen -** The flooded village area was 200 m x 100 m with a flood depth of 1800 mm.	Long Bin Tsuen is a particularly low lying agricultural area with a few structures which are subject to flooding during heavy rainfall.	The proposed Bypass Floodway under 70CD will alleviate the flooding in the area.	70CD	Late 02	Late 05
	YL5	**Lam Hau Yuen -** The flooded village area was 80 m x 150 m with a flood depth varying from 800 mm to 1200 mm.	This is a flooding blackspot. This area is a low lying village.	The proposed drainage channel under 22 CD and Bypass Floodway under 70CD will improve the situation.	22CD (Stage 2) 70CD	Late 02 Late 02	Early 05 Late 05
	YL6	**Chuk Yuen Tsuen -** The flooded village area was 700 m x 200 m with a flood depth varying from 300 mm to 1000 mm.	This is a flooding blackspot. Chuk Yuen Tsuen is a low-lying area and is frequently flooded.	The proposed village flood protection scheme under 30CD and drainage channel under 100CD will alleviate the flooding situation.	30CD 100CD	Late 00 Late 99	Early 03 Late 02
	YL7	**Shui Pin Tsuen, Shui Pin Wai -** The flooded village area was about 200 m x 100 m and 70m x 40m with a flood depth of 1300 mm and 1500 mm respectively.	The area is low-lying and is frequently flooded.	The proposed village flood protection scheme under 74CD and Bypass Floodway under 70CD will improve the situation.	74CD 70CD	Late 01 Late 02	Mid 05 Late 05
	YL8	**Ma Tin Tsuen -** The flooded village area was about 350 m x 120 m with a flood depth of 1500 mm.	This is a flooding blackspot. Ma Tin Tsuen is a low-lying village area which is frequently flooded.	The proposed village flood protection scheme under 74CD, drainage channel under 22CD and Bypass Floodway under 70CD will improve the situation.	74CD 22CD (Stage 2) 70CD	Late 01 Late 02 Late 02	Mid 05 Early 05 Late 05

Major Flooding Locations on 14 April 2000

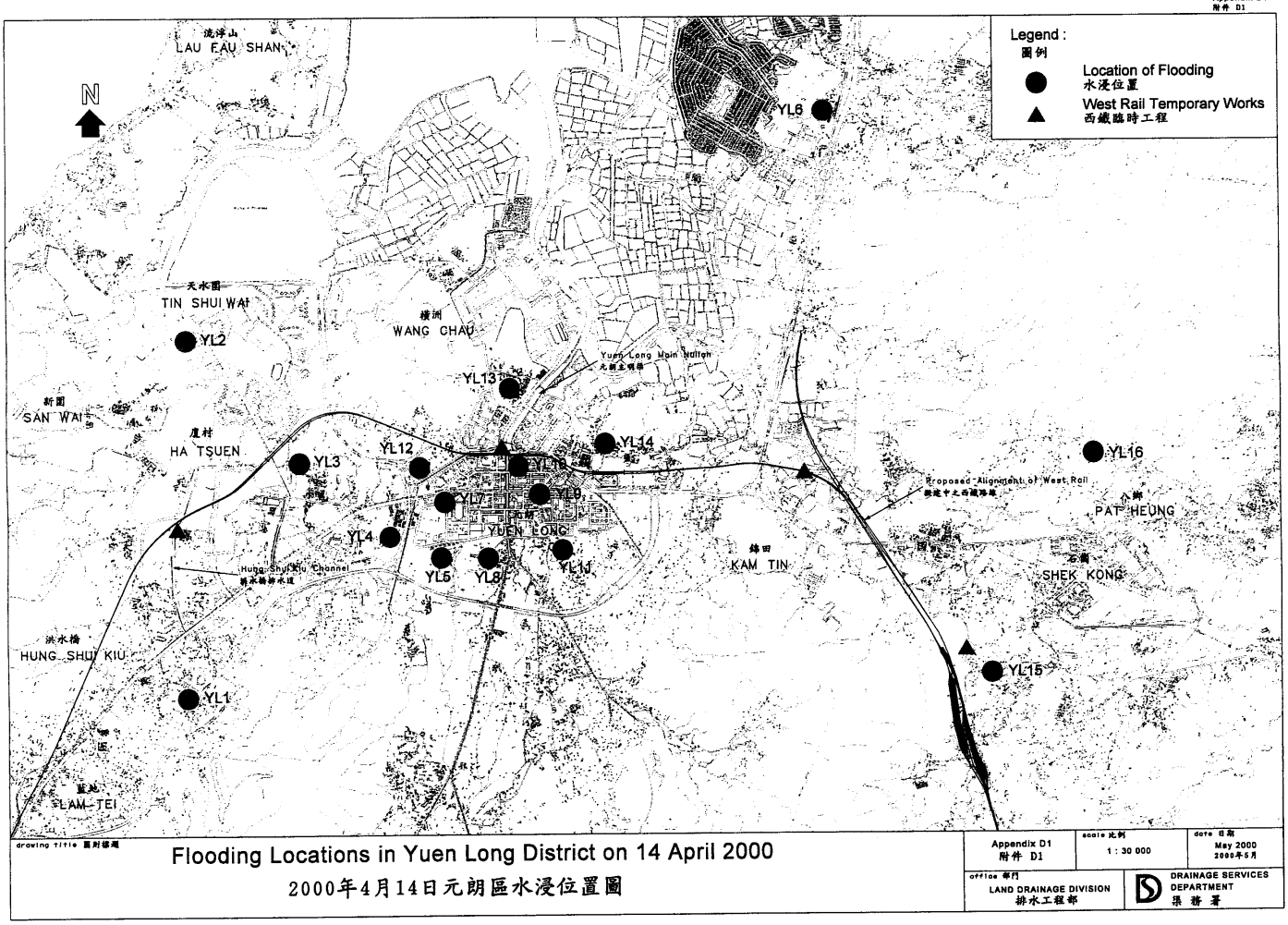
DISTRICT	CODE No.	FLOODED AREA WITH BRIEF DESCRIPTION	CAUSES OF FLOODING	MITIGATION MEASURES	RELEVANT PWP ITEMS TO ALLEVIATE THE FLOODING SITUATION		
					ITEM	START DATE	FINISH DATE
YUEN LONG	YL9	**Castle Peak Road (near Kei Tei) -** This is one of the busiest roads in Yuen Long Town Centre. The flooded area was about 150 m x 25 m with a flood depth of 300mm.	The cause of flooding is due to the severe intensity of the rainstorm coupled with the inadequate capacity of the existing drainage system in a low-lying topography. Flood depth could have been increased slightly due to KCRC's temporary works.	The proposed drainage works under 92CD and Bypass Floodway under 70CD will improve the situation.	92CD 70CD	Late 01 Late 02	Mid 06 Late 05
	YL10	**Tai Kiu Tsuen -** The flooded village area was about 60m x 60m with a flood depth of 500mm.	The cause of flooding is due to the severe intensity of the rainstorm coupled with the inadequate capacity of the existing drainage system in a low-lying topography. Flood depth could have been increased slightly due to KCRC's temporary works.	The proposed village flood protection scheme under 74CD and Bypass Floodway under 70CD will improve the situation.	74CD 70CD	Mid 02 Late 02	Late 04 Late 05
	YL11	**Tai Kei Leng, Yuen Long -** The flooded village area was about 250 m x 300 m with a flood depth varying from 300 mm to 1000 mm.	Tai Kei Leng is a low-lying area and the drainage system is inadequate. The capacity of the adjacent stormwater drain and box culvert is unable to cope with a 5-year return period rainstorm.	The proposed local drainage under 74CD and Bypass Floodway under 70CD will improve the situation.	74CD 70CD	Mid 02 Late 02	Mid 05 Late 05
	YL12	**Chun Hing San Tsuen -** The flooded village area was about 100 m x 50 m with a flood depth of 1000 mm.	This is a flooding blackspot. Chun Hing San Tsuen is a low-lying area and the village drainage is inadequate.	The proposed Bypass Floodway under 70CD will improve the situation.	70CD	Late 02	Late 05

Major Flooding Locations on 14 April 2000

DISTRICT	CODE No.	FLOODED AREA WITH BRIEF DESCRIPTION	CAUSES OF FLOODING	MITIGATION MEASURES	RELEVANT PWP ITEMS TO ALLEVIATE THE FLOODING SITUATION		
					ITEM	START DATE	FINISH DATE
YUEN LONG	YL13	**Wang Chau, Fuk Hing Tsuen, Ting Fook Villas, Sai Tau Wai -** The flooded village area was 20 m x 20 m, 70 m x 60 m and 50 m x 50 m respectively with a flood depth of 600 mm.	This is a flooding blackspot. Wang Chau is a low-lying area and is frequently flooded.	The proposed village flood protection scheme under 30CD will improve the situation.	30CD	Early 02	Mid 04
	YL14	**Tung Tau Tsuen -** The flooded village area was about 400 m x 80 m with a flood depth of 300mm.	Tung Tau Tsuen is a low-lying area and the village drainage is inadequate.	The drainage works under 278CL and the proposed Bypass Floodway under 70CD will improve the situation.	278CL 70CD	Early 00 Late 02	Mid 02 Late 05
	YL15	**Shek Wu Tong, Yuen Long -** The flooded village area was about 200 m x 30 m with a flood depth of 800mm.	The existing drainage is inadequate.	The proposed drainage channels under 92CD and 97CD will improve the situation.	92CD 97CD	Late 01 Mid 99	Mid 06 Early 02
	YL16	**Tai Kong Po, Tsat Sing Kong Tsuen -** The flooded village area was about 70 m x 250 m and 30 m x 50 m respectively with a flood depth of 500 mm.	This is a flooding blackspot. The villages are low-lying area and the existing drainage is inadequate.	The proposed drainage channels under 92CD and 95CD will improve the situation.	92CD 95CD	Late 01 Mid 99	Mid 06 Early 02

Major Flooding Locations on 14 April 2000

DISTRICT	CODE No.	FLOODED AREA WITH BRIEF DESCRIPTION	CAUSES OF FLOODING	MITIGATION MEASURES	RELEVANT PWP ITEMS TO ALLEVIATE THE FLOODING SITUATION		
					ITEM	START DATE	FINISH DATE
TUEN MUN	TM1	**Tsz Tin Tsuen** - Village type areas with channels draining to Tuen Mun Nullah just upstream of West Rail Siu Hong Station. The flooded village area was 100 000m^2. The depth of flooding was up to 1m.	Insufficient drainage capacity coupled with low-lying topography are the main cause of the flooding.	The solution is to improve existing channels to provide adequate drainage capacity under RPIS Items TM004 and TM064. Works under these items will start in Dec 2001 for completion in Dec 2003. Some additional drains will also be built by TDD when they develop Area 54 under PWP Item 7666CL.	TM004 TM064 7666CL	Late 01 Late 01 Mid 02	Late 03 Late 03 Mid 04
	TM2	**LRT along Lung Mun Road** - 1300m long of the Lung Mun Road and Wu Shan Road was flooded to a depth of 400mm. LRT services from Ferry Pier Terminus to Ming Kum Road was suspended for four hours.	This urban area has adequate drainage and is rarely flooded. Flooding was caused by serious blockage of the drainage system due to a mud slide above a TDD site.	Immediate action was taken by DSD, HyD and TDD to clear the blockage at the drainage inlet. DSD is carrying out further desilting to the drainage system. Permanent drainage system and related debris flow prevention measures form part of 601 TH.	601 TH	Late 98	Late 01
	TM3	**Tsing Fat Street** - An area of 150 m x 30 m adjacent to Tsing Fat Street was flooded to a depth of 2m.	Flooding was caused by illegal earth filling of the existing open channel.	DSD has completed the clearance of the open channel. DSD has also requested DLO to stop any illegal filling activities in the vicinity of the open channel.	Nil	-	-

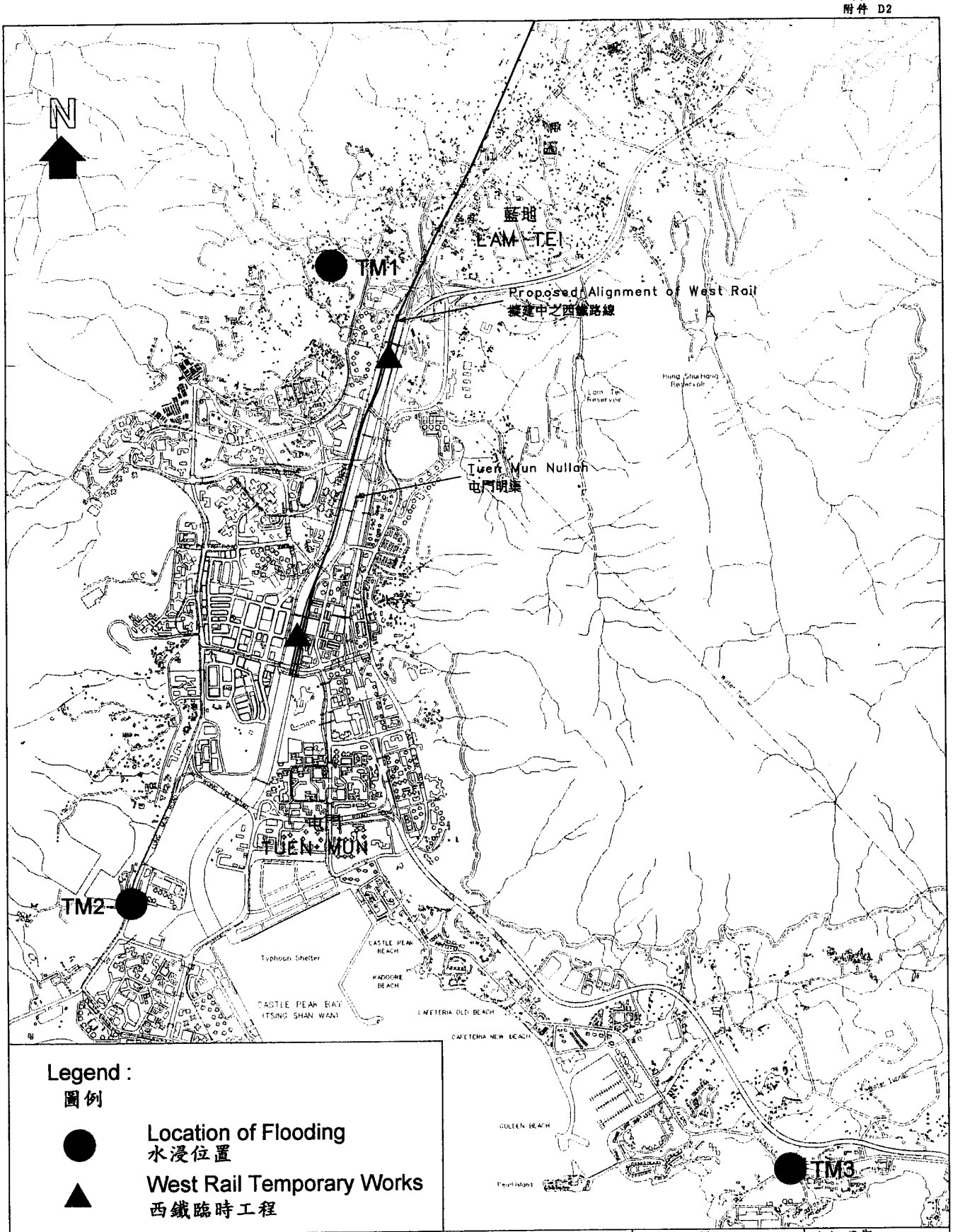


drawing title 圖則標題

Flooding Locations in Yuen Long District on 14 April 2000

2000年4月14日元朗區水浸位置圖

Appendix D1 附件 D1	scale 比例 1 : 30 000	date 日期 May 2000 2000年5月
office 部門 LAND DRAINAGE DIVISION 排水工程部		DRAINAGE SERVICES DEPARTMENT 渠務署



Legend :
圖例

- Location of Flooding 水浸位置
- West Rail Temporary Works 西鐵臨時工程

drawing title 圖則標題

Flooding Locations in Tuen Mun District on 14 April 2000

2000年4月14日屯門區水浸位置圖

Appendix D2 附件 D2	scale 比例 1 : 30 000	date 日期 May 2000 2000年5月

office 部門
LAND DRAINAGE DIVISION
排水工程部

DRAINAGE SERVICES DEPARTMENT
渠務署