

**For discussion
on 23 June 2008**

**Legislative Council
Panel on Environmental Affairs**

**Provision of sewerage in
Tolo Harbour, Lam Tsuen, North District, Central and East Kowloon**

PURPOSE

This paper seeks Members' support for the Administration's proposal to upgrade the following four projects to Category A prior to submission to the Public Works Subcommittee for consideration with a view to seeking the Finance Committee's funding approval –

- (a) **125DS (part)** - Tolo Harbour sewerage of unsewered areas stage 1 phase 2C at an estimated cost of \$299.0 million in money-of-the-day (MOD) prices to provide public sewerage to the unsewered areas in Tolo Harbour;
- (b) **332DS (part)** - Lam Tsuen Valley sewerage at an estimated cost of \$115.1 million in money-of-the-day (MOD) prices to provide trunk sewerage and sewage pumping facilities for groups of villages in Lam Tsuen Valley;
- (c) **339DS (part)** - North District sewerage stage 1 phase 2C and stage 2 phase 1 at an estimated cost of \$81.6 million in money-of-the-day (MOD) prices to provide trunk sewerage and sewage pumping facilities for groups of villages in Kau Lung Hang;
- (d) **344DS (part)** - Upgrading of Central and East Kowloon sewerage - packages 1 to 4 at an estimated cost of \$252.1 million in money-of-the-day (MOD) prices to upgrade the existing sewers by new sewers in Central and East Kowloon areas.

PROPOSAL AND JUSTIFICATION

125DS (part) - Tolo Harbour sewerage of unsewered areas stage 1 phase 2C

2. At present, domestic sewage from unsewered areas in Sha Tin and Tai Po discharges into nearby coastal waters either without treatment, e.g. the cottage area in Sha Tin, or after treatment by private treatment facilities. Most of

these private treatment facilities, if available, are septic tanks and soakaway systems. These treatment facilities are often ineffective in removing pollutants due to their close proximity to watercourses¹ and inadequate maintenance². Sewage discharged from these unsewered areas is a source of pollution to the receiving water in Tolo Harbour.

3. As a long term measure to address the water pollution problem in Tolo Harbour and its catchment, we included the project “Tolo Harbour sewerage of unsewered areas” as **125DS** in the Public Works Programme in August 1990 with a view to providing public sewerage facilities to the unsewered areas in the Tolo Harbour catchment. The project includes constructing public sewers and pumping stations to convey sewage arising from these unsewered areas to the existing sewerage in Sha Tin and Tai Po and providing new communal septic tanks with adsorption field³ to serve remote villages.

4. Works under **125DS** were divided into two stages. Stage 1 covers works in 90 unsewered areas in Sha Tin and Tai Po with higher pollution loads. Stage 2 covers works in the remaining 41 unsewered areas. Stage 1 works were further divided into two phases. Stage 1 phase 1 works comprise four sub-phases (namely 1A, 1B, 1C and 1D) while stage 1 phase 2 works include three sub-phases (namely 2A, 2B and 2C). We have so far completed the works under sub-phases 1A, 1B, 1C, 1D, 2A and 2B in 73 unsewered areas. The implementation plan and updated cost estimate of the whole Tolo Harbour sewerage of unsewered areas project is summarised at **Enclosure 1**.

5. We now propose to upgrade stage 1 phase 2C of 125DS to Category A. This comprises the provision of sewerage facilities to serve a population of 30 000 in 17 unsewered areas. A location plan of the unsewered areas covered under stage 1 phase 2C is at **Enclosure 2**. Sewers will be constructed up to the lot boundary of individual houses wherever viable, to facilitate their final sewer connection.

6. We plan to commence construction of stage 1 phase 2C in January 2009 for completion in June 2012.

332DS (part) - Lam Tsuen Valley sewerage

7. At present, sewage from village houses in Lam Tsuen Valley is discharged into nearby water bodies after treatment by private treatment facilities,

¹ Soakaway systems operate by allowing the effluent to percolate through the soil so that pollutants would be removed in a natural manner. However, if a system is located in an area where the underground water table is high such as an area in close proximity to watercourses, it cannot function properly.

² Inadequate maintenance of septic tanks or soakaway systems would affect their pollutant removal efficiency and may even lead to an overflow of effluent.

³ An adsorption field provides the requisite surface area for proper treatment of septic tank effluent.

such as septic tanks and soakaway systems. These private treatment facilities in general are not effective in removing pollutants due to their close proximity to watercourses and inadequate maintenance. Their discharge is a source of pollution to the Lam Tsuen Valley area (which is a water gathering ground) and the receiving water at Tolo Harbour.

8. To improve the situation, we propose public sewerage under 332DS to serve 27 villages in the Lam Tsuen Valley area, of a total projected population of about 21 500. The facilities will convey domestic sewage to the Tai Po Sewage Treatment Works for treatment before disposal, thereby mitigating water pollution in the Lam Tsuen Valley area and Tolo Harbour and improving the living environment.

9. The scope of works under **332DS** to be part-upgraded will provide trunk sewerage and sewage pumping facilities comprising –

- (a) construction of a new sewage pumping station near Lam Kam Road Interchange;
- (b) construction of about 0.7 kilometres (km) of rising mains at Tai Po Tai Wo Road;
- (c) construction of about 3.3 km of gravity sewers at Lam Kam Road; and
- (d) ancillary works.

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

10. We plan to commence construction of this part of **332DS** in December 2008 for completion in June 2012.

339DS (part) - North District sewerage stage 1 phase 2C and stage 2 phase 1

11. At present, sewage discharged from villages in Kau Lung Hang, northern Tai Po is a source of pollution to the adjacent water gathering ground. To improve the situation, we propose public sewerage under 339DS to serve 7 villages at Kau Lung Hang area, of a total projected population of about 17 000. The facilities will convey sewage to the Shek Wu Hui Sewage Treatment Works for treatment before disposal, thereby mitigating water pollution in the Kau Lung Hang area and improving the living environment.

12. The scope of works under **339DS** to be part-upgraded will provide trunk sewerage and sewage pumping facilities comprising –

- (a) construction of a new sewage pumping station at Nam Wa Po;

- (b) construction of about 0.5 km of rising mains at Tai Wo Service Road West;
- (c) construction of about 1.1 km of gravity sewers at Tai Wo Service Road West and Wo Hing Road; and
- (d) ancillary works.

A site plan showing the proposed works is at **Enclosure 4**.

13. We plan to commence construction of this part of **339DS** in December 2008 for completion in December 2011.

344DS (part) - Upgrading of Central and East Kowloon sewerage - packages 1 to 4

14. In view of the planned housing and other developments which would result in significant population change in Central and East Kowloon, we commissioned a review, entitled “Review of Central and East Kowloon Sewerage Master Plans (the Review)”, to assess the adequacy of the sewerage facilities in the areas. The Review was completed in August 2003 and recommended upgrading of some existing sewerage facilities as well as provisioning of new sewerage facilities to cater for the planned developments and forecasted population change.

15. We employed Consultants on 31 May 2007 to carry out the investigation, design and construction supervision of the sewerage upgrading works. The Consultants have ascertained the updated situation by conducting an overall review on the sewerage in Central and East Kowloon areas and confirmed the imminent need to upgrade these existing sewerage facilities to tie in with the future developments in the nearby areas. Without improvement, local surcharging and overflow will occur, in particular at those sections downstream of the future developments. We therefore propose to upgrade the existing sewers by new sewers of larger diameter to provide adequate flow capacity.

16. The scope of works under **344DS** to be part-upgraded includes –

- (a) upgrading of existing sewers and construction of new sewers of a total length of about 6.3 km in Kwun Tong, Wong Tai Sin, Kowloon City and To Kwa Wan; and
- (b) upgrading of seven existing dry weather flow interceptors in To Kwa Wan, Kowloon City, San Po Kong, Choi Hung, Kowloon Bay and Ngau Tau Kok.

The locations of the proposed works are shown at **Enclosure 5**.

17. We plan to commence construction under **344DS** in December 2008 for completion in June 2012.

FINANCIAL IMPLICATIONS

18. We estimate the capital costs⁴ of the proposed works to be \$747.8 million in MOD prices made up as follows-

	\$ million (MOD)
(a) 125DS (part) - Tolo Harbour sewerage of unsewered areas stage 1 phase 2C	299.0
(b) 332DS (part) - Lam Tsuen Valley sewerage	115.1
(c) 339DS (part) - North District sewerage stage 1 phase 2C and stage 2 phase 1	81.6
(d) 344DS (part) - Upgrading of Central and East Kowloon sewerage - packages 1 to 4	252.1
Total	747.8

19. These estimated costs are yet to be confirmed, and the final figures will be included in the PWSC papers in due course.

20. We estimate that the proposed works will create 472 jobs⁴ and provide 17 469 man-months as follows:

Projects	No. of Jobs for		Total No. of Jobs Created	Employment In Man-months
	Labourers	Professional/ Technical Staff		
125DS (part)	135	32	167	6 267
332DS (part)	78	18	96	3 631

⁴ These are the latest estimates of the capital costs and new job opportunities. We will finalize the project costs and new job opportunities, and include the cost breakdown, prior to submitting the proposals to the PWSC for consideration.

339DS (part)	47	11	58	1 863
344DS (part)	124	27	151	5 708
Total	384	88	472	17 469

PUBLIC CONSULTATION

125DS (part) - Tolo Harbour sewerage of unsewered areas stage 1 phase 2C

21. We consulted the Tai Po Rural Committee and Environmental, Housing and Works Committee of the Tai Po District Council on 8 November 2006 and 12 January 2007 respectively. We also consulted the Sha Tin Rural Committee and Development and Housing Committee of the Sha Tin District Council on 17 November 2006 and 27 February 2007 respectively. They all supported the implementation of the proposed works.

332DS (part) - Lam Tsuen Valley sewerage

22. We consulted the Tai Po Rural Committee on 24 July 2007, and the Environment, Housing and Works Committee of the Tai Po District Council on 12 March 2008. They all supported the proposed works.

339DS (part) - North District sewerage stage 1 phase 2C and stage 2 phase 1

23. We consulted the Tai Po Rural Committee on 11 May 2007, the Traffic & Transport Committee of the North District Council on 11 September 2007, and the Environment, Housing and Works Committee of the Tai Po District Council on 14 September 2007. They all supported the proposed works.

344DS (part) - Upgrading of Central and East Kowloon sewerage - packages 1 to 4

24. We consulted the Kwun Tong District Council Traffic and Transport Committee, the Yau Tsim Mong District Council Traffic and Transport Committee, the Wong Tai Sin District Council Traffic and Transport Committee and the Kowloon City District Council Housing and Infrastructure Committee on 27 February 2008, 6 March 2008, 8 April 2008 and 30 April 2008 respectively. They all supported the implementation of the proposed works.

ENVIRONMENTAL IMPLICATIONS

125DS (part) - Tolo Harbour sewerage of unsewered areas stage 1 phase 2C

25. The proposed sewerage under stage 1 phase 2C of **125DS** is not a designated project under the Environmental Impact Assessment (EIA) Ordinance.

We assessed the environmental impacts of the sewerage works and concluded that the project would have limited potential environmental impacts arising from the operation and maintenance of the sewer and implementation of standard pollution control measures during construction would be adequate.

332DS (part) - Lam Tsuen Valley sewerage

26. For **332DS**, the proposed pumping station at Lam Kam Interchange is a designated project under the EIA Ordinance. Having regard to the project profile, the Director of Environmental Protection is satisfied that the environmental impact of the proposed pumping station can meet the requirements of the Technical Memorandum on EIA Process and granted permission to apply directly for an environmental permit. We shall implement the mitigation measures set out in the project profile. We have included in the project estimates the cost to implement all necessary measures to mitigate the environmental impacts. The proposed trunk sewerage works will not cause long term environmental impact.

339DS (part) - North District sewerage stage 1 phase 2C and stage 2 phase 1

27. For **339DS**, we completed an Environmental Study (ES) for the concerned works in 2008. The ES concluded that the environmental impacts arising from the proposed works could be mitigated within established standards and guidelines with full implementation of the recommended mitigation measures. We will implement the mitigation measures as recommended.

344DS (part) - Upgrading of Central and East Kowloon sewerage - packages 1 to 4

28. The proposed sewerage works are not a designated project under the EIA Ordinance. We have completed the Preliminary Environmental Review for the proposed works and concluded that the projects would not cause any long term adverse environmental impact.

29. For short term impacts during construction of all the sewerage projects described above, we will control noise, dust and site runoff within the established standards and guidelines through implementation of mitigation measures in the works contracts, such as the use of silenced construction plants to reduce noise generation, water-spraying to reduce emission of fugitive dust, and proper treatment of site run-off before discharge. We will also carry out close site inspection to ensure that these recommended mitigation measures and good site practice are properly implemented on site.

30. We have considered in the planning and design stages ways to reduce the generation of construction waste where possible. For example, we have designed the alignment of the proposed sewerage works in such a manner

that excavation and demolition of existing structures will be minimized. In addition, we will require the contractor to reuse inert construction waste including excavated soil for backfilling on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities. We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.

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

32. We estimate that the four projects will generate in total about 227 700 tonnes of construction waste. Of these, we will reuse about 118 200 tonnes (52%) of inert construction waste on site and deliver 101 200 tonnes (44%) of inert construction waste to public fill reception facilities⁵ for subsequent reuse. In addition, we will dispose of 8 300 tonnes (4%) of non-inert construction waste at landfills. The total cost for accommodating the construction waste at public fill reception facilities and landfill sites is estimated to be about \$3.8 million for these projects (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne⁶ at landfills.)

ADVICE SOUGHT

33. Members are invited to support the Administration's proposal to upgrade the following four projects to Category A for consideration by the Public Works Subcommittee, with a view to seeking funding approval by the Finance Committee -

- (a) **125DS (part)** - Tolo Harbour sewerage of unsewered areas stage 1 phase 2C at an estimated cost of \$299.0 million in money-of-the-day (MOD) prices to provide public sewerage to the unsewered areas in Tolo Harbour;
- (b) **332DS (part)** - Lam Tsuen Valley sewerage at an estimated cost of

⁵ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

⁶ 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 is likely to be more expensive) when the existing ones are filled.

\$115.1 million in money-of-the-day (MOD) prices to provide trunk sewerage and sewage pumping facilities for group of villages in Lam Tsuen Valley;

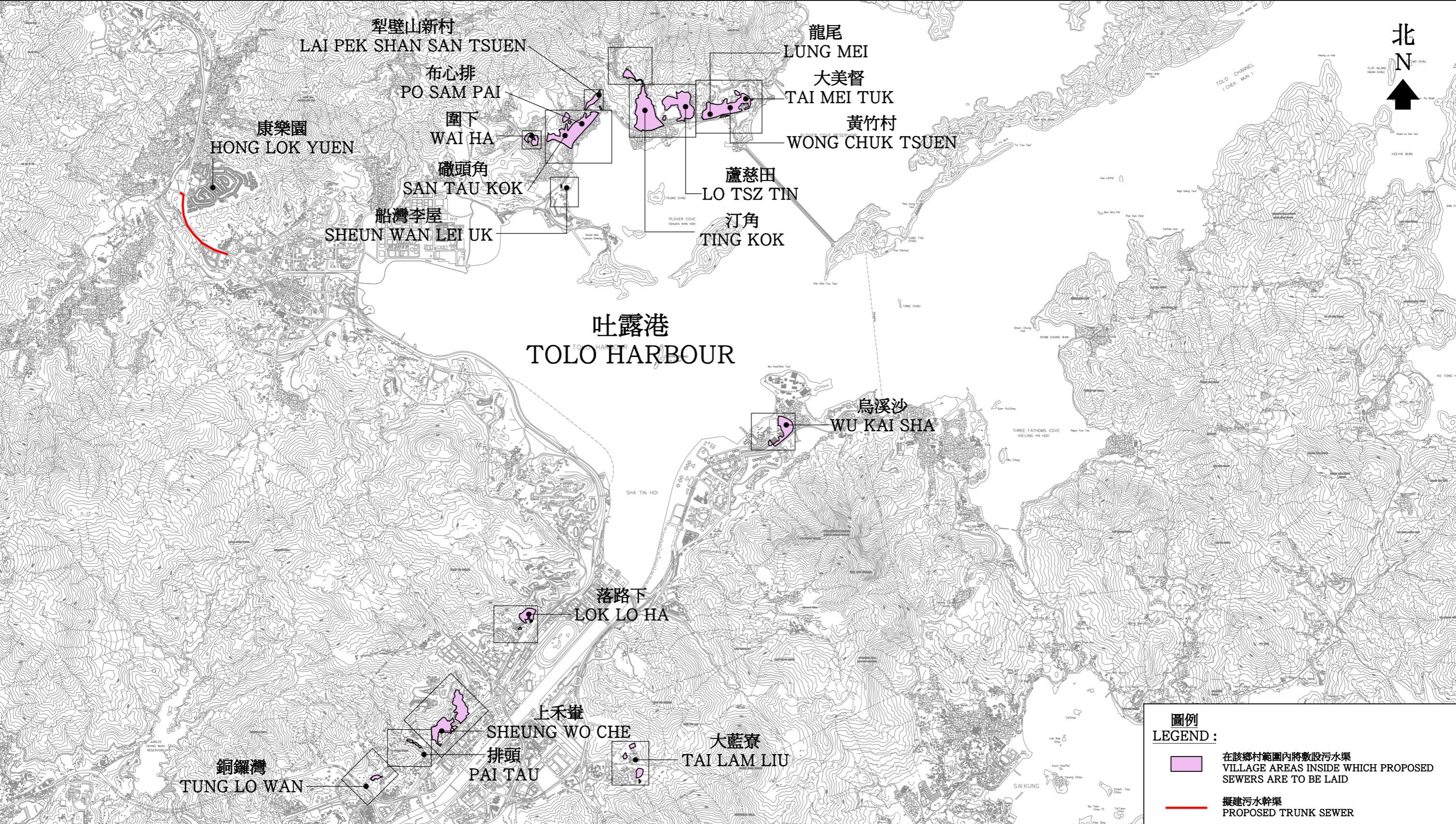
- (c) **339DS (part)** - North District sewerage stage 1 phase 2C and stage 2 phase 1 at an estimated cost of \$81.6 million in money- of-the-day (MOD) prices to provide trunk sewerage and sewage pumping facilities for groups of villages in Kau Lung Hang;
- (d) **344DS (part)** - Upgrading of Central and East Kowloon sewerage - packages 1 to 4 at an estimated cost of \$252.1 million in money-of-the-day (MOD) prices to upgrade the existing sewers by new sewers in Central and East Kowloon areas.

Environmental Protection Department
June 2008

Tolo Harbour Sewerage of Unsewered Areas - Updated Implementation Plan

PWP Item No.	Description	No. of unsewered areas	Start Date	Completion Date	Updated Cost Estimate (\$million in Sept 2007 prices)	Estimated Population Served
Stage 1 Phase 1 (covering 43 unsewered areas)						
137DS/A	Design Consultancy	--	Mar 1991	Dec 2003	11.8	--
163DS/A	Stage 1 Phase 1A	15	Jun 1993	May 1995	57.2	17 300
177DS/A	Stage 1 Phase 1B	10	Oct 1994	Aug 1998	72.3	8 200
284DS/A	Stage 1 Phase 1C	6	Jun 1997	Feb 1999	27.8	4 800
328DS/A	Stage 1 Phase 1D	12	Jan 2002	Jun 2004	45.5	3 400
Sub-total					214.6	33 700
Stage 1 Phase 2 (covering 47 unsewered areas)						
179DS/A	Design Consultancy	--	May 1995	Apr 2009	19.0	--
213DS/A	Stage 1 Phase 2A	15	May 1998	May 2001	89.0	11 800
328DS/A	Stage 1 Phase 2B	15	Jan 2002	Jun 2005	144.9	12 100
125DS/B	Stage 1 Phase 2C	17	Jan 2009	Jun 2012	263.8	30 000
Sub-total					516.7	53 900
Total					731.3	87 600

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圖例
LEGEND:

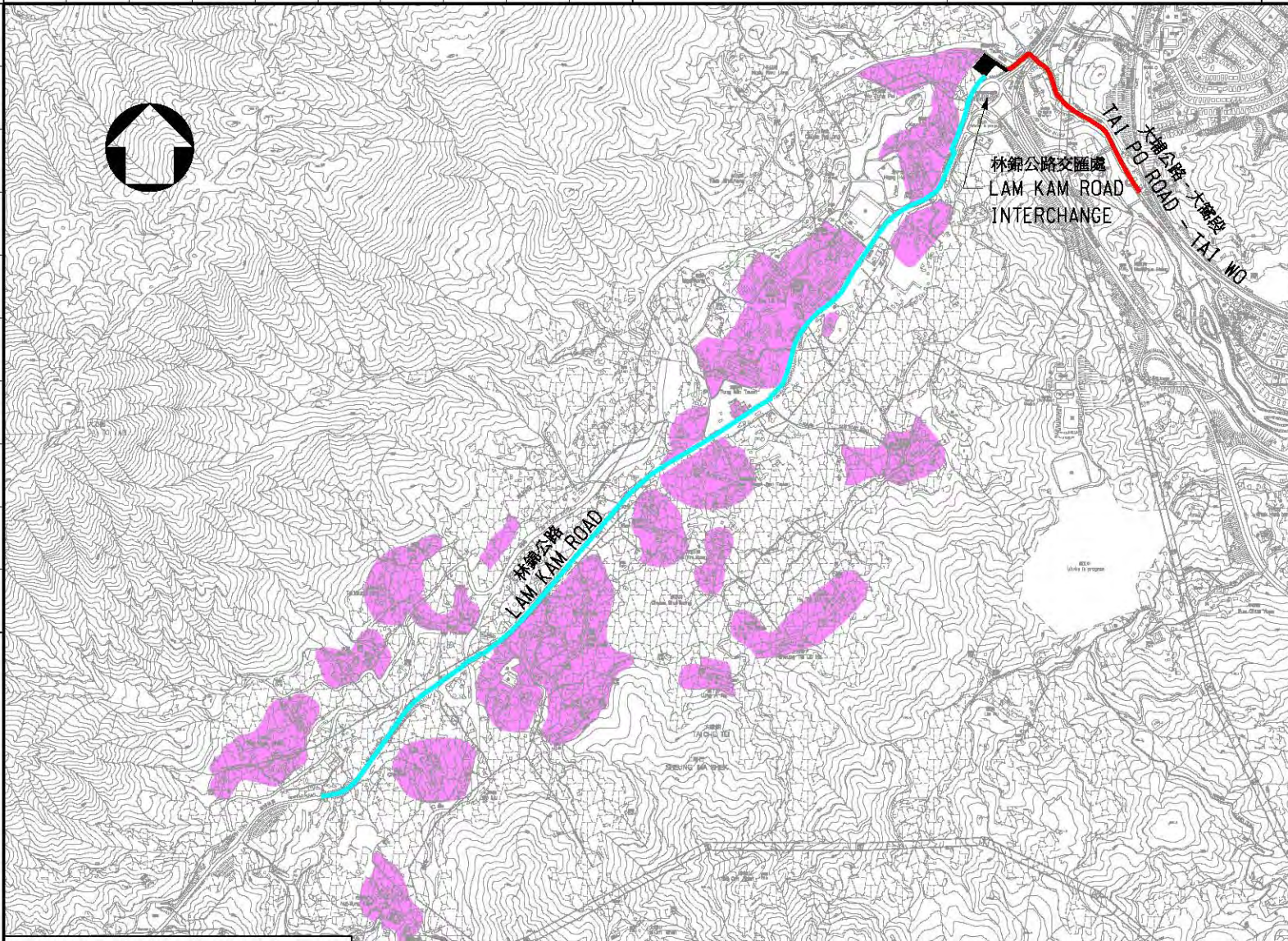
- 在該鄉村範圍內將敷設污水渠
VILLAGE AREAS INSIDE WHICH PROPOSED SEWERS ARE TO BE LAID
- 擬建污水幹渠
PROPOSED TRUNK SEWER

<p>圖則名稱 drawing title</p> <p>工務計劃項目第125DS號 (部分) - 吐露港未敷設污水設施地區的污水收集系統, 第1階段第2C期 PWP ITEM NO. 125DS (PART) - TOLO HARBOUR SEWERAGE OF UNSEWERED AREAS STAGE 1 PHASE 2C</p>	<p>繪畫 drawn <i>ORIGINAL SIGNED</i> C.W. CHAN</p> <p>日期 date 03-03-2008</p>	<p>圖則編號 drawing no.</p> <p>DCM/2008/006</p> <p>比例 scale N.T.S.</p>
<p>核對 checked <i>ORIGINAL SIGNED</i> W.F. WONG</p> <p>日期 date 03-03-2008</p>		<p>保留版權 COPYRIGHT RESERVED</p>
<p>批核 approved <i>ORIGINAL SIGNED</i> S.K. WONG</p> <p>日期 date 03-03-2008</p>		<p>香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION</p>
<p>部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION</p>		



LEGEND:

- 擬建的污水幹渠
PROPOSED TRUNK SEWERS
- 擬建的林村谷污水泵房
PROPOSED LAM TSUEN VALLEY PUMPING STATION
- 擬建的污水泵喉
PROPOSED RISING MAINS
- 受惠於擬議污水收集系統的鄉村
VILLAGES TO BE SERVED BY THE PROPOSED SEWERAGE



PWP No.332DS (part)

圖則名稱 drawing title
林村谷污水收集系統
LAM TSUEN VALLEY SEWERAGE

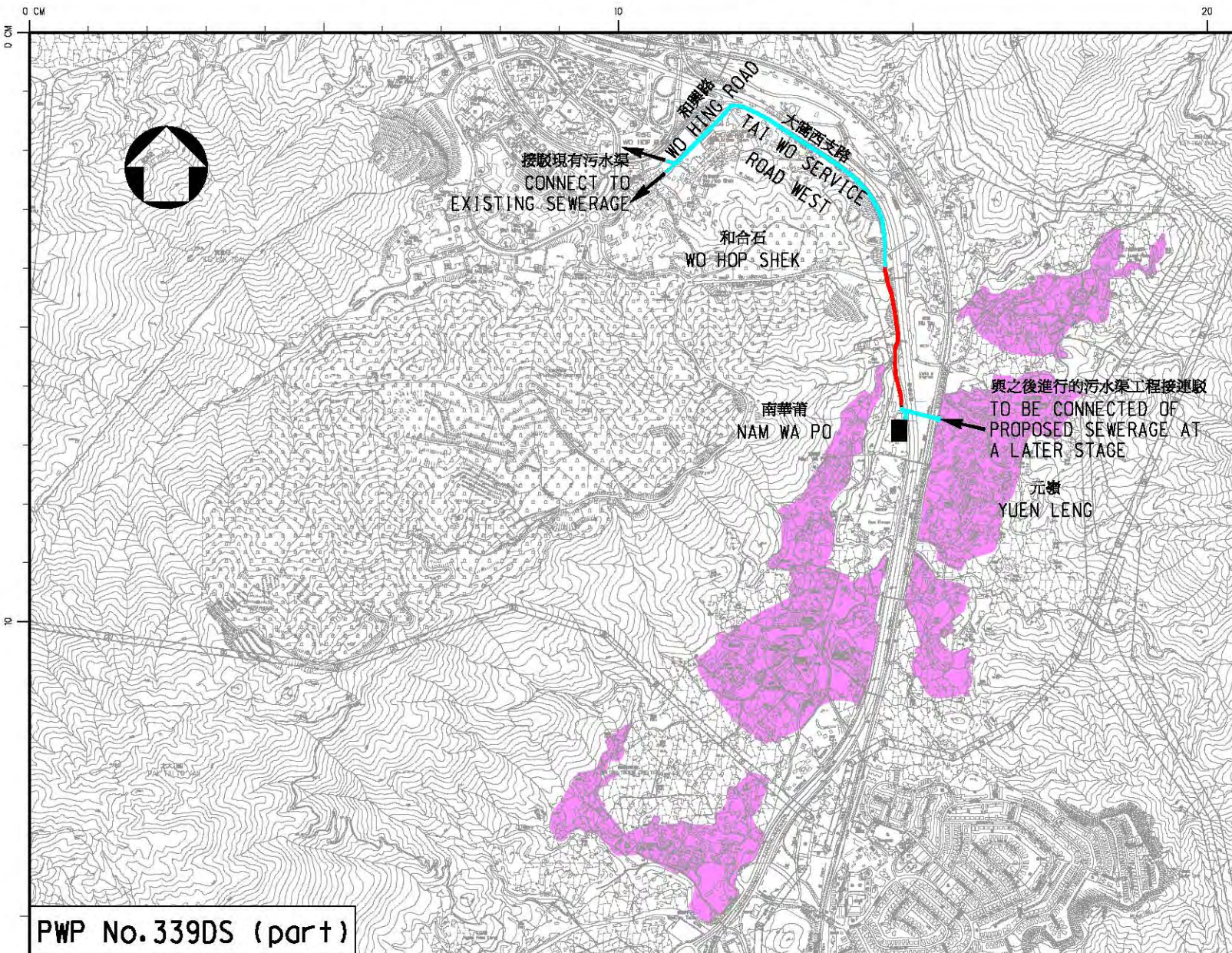
繪畫 drawn	SIGNED	C.K.LAM	日期 date	15APR08
核對 checked	SIGNED	K.H.TSE	日期 date	02JUN08
批核 approved	SIGNED	K.S.TONG	日期 date	02JUN08
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION			

A	13JUN08	GENERAL REVISION	SIGNED
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圖則編號 drawing no.	比例 scale
DPM/332DS0/0002A	N.T.S.

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
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LEGEND:

- 擬建的污水幹渠
PROPOSED TRUNK SEWERS
- 擬建的南華滯污水泵房
PROPOSED NAM WA PO PUMPING STATION
- 擬建的污水泵喉
PROPOSED RISING MAINS
- 受惠於擬議污水收集系統的鄉村
VILLAGES TO BE SERVED BY THE PROPOSED SEWERAGE

PWP No.339DS (part)

圖則名稱 drawing title
 北區污水收集系統第1階段第2C期及第2階段第1期
 NORTH DISTRICT SEWERAGE, STAGE 1 PHASE 2C
 AND STAGE 2 PHASE 1

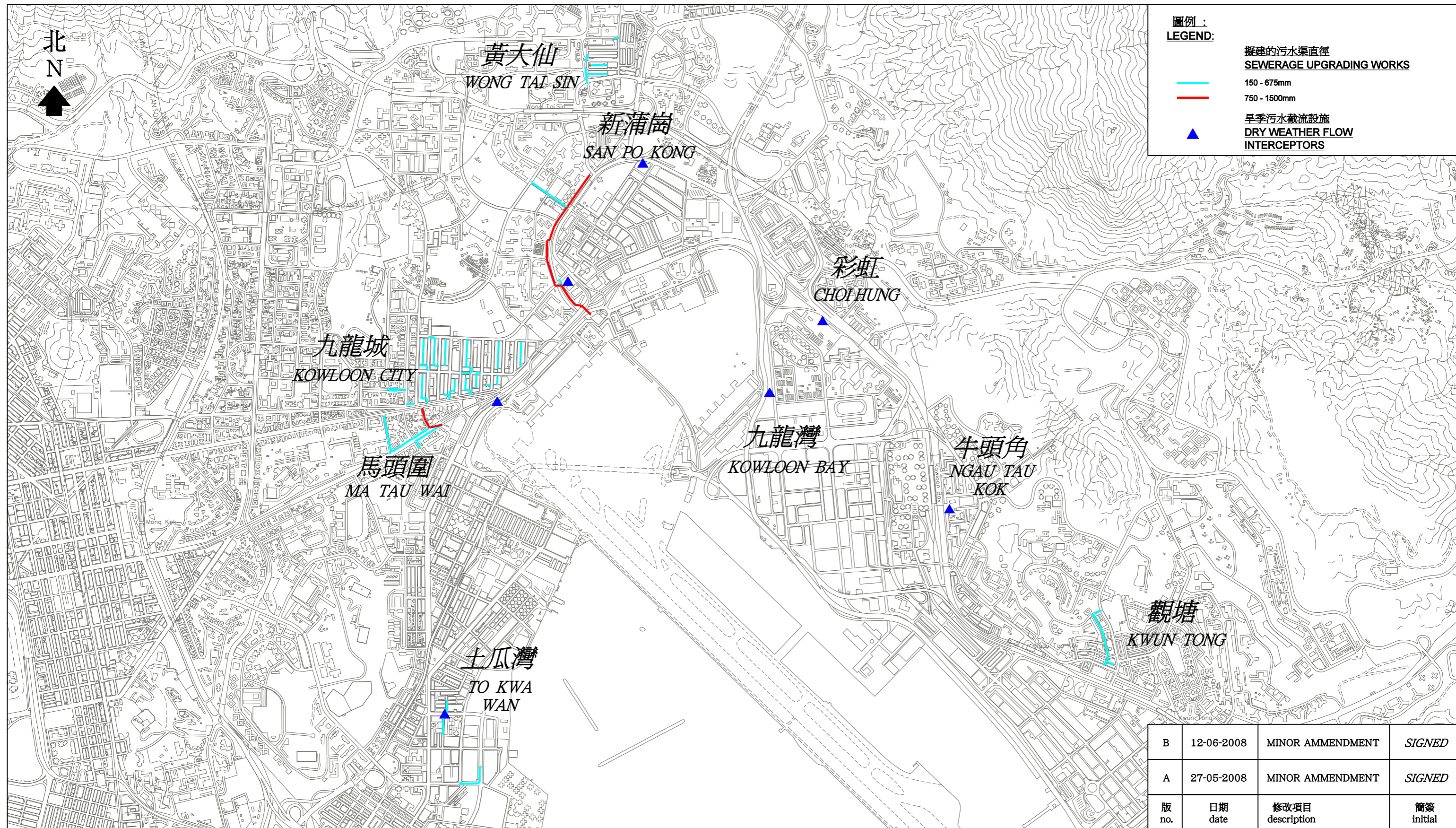
繪畫 drawn	SIGNED	C.K.LAM	日期 date	15APR08
核對 checked	SIGNED	S.W.LAM	日期 date	02JUN08
批核 approved	SIGNED	K.S.TONG	日期 date	02JUN08
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION			

A	13JUN08	GENERAL REVISION	SIGNED
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圖則編號 drawing no.	比例 scale
DPM/339DS/0004A	N.T.S.

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B	12-06-2008	MINOR AMMENDMENT	SIGNED
A	27-05-2008	MINOR AMMENDMENT	SIGNED
版 no.	日期 date	修改項目 description	簡簽 initial

圖則名稱 drawing title
 工務計劃項目第344DS號(部分) —
 九龍中部及東部污水收集系統改善工程 — 第1-4部分
 PWP ITEM NO. 344DS (PART) -
 UPGRADING OF CENTRAL AND EAST KOWLOON SEWERAGE - PACKAGES 1 TO 4

繪畫 drawn	ORIGINAL SIGNED	C.W. CHAN	日期 date	26-05-2008
核對 checked	ORIGINAL SIGNED	C.M. CHONG	日期 date	26-05-2008
批核 approved	ORIGINAL SIGNED	W.K. NG	日期 date	26-05-2008

部門 office
 顧問工程管理部
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