

**For discussion
on 23 May 2011**

**Legislative Council
Panel on Environmental Affairs**

Provision of Sewerage in North District and Tolo Harbour Catchment

PURPOSE

This paper seeks Members' support for our proposals to —

- (a) upgrade part of **332DS – Lam Tsuen Valley sewerage** to Category A at an estimated cost of \$274.4 million;
- (b) upgrade part of **339DS – North District sewerage, stage 1 phase 2C and stage 2 phase 1** to Category A at an estimated cost of \$226.8 million; and
- (c) upgrade part of **345DS – North District sewerage, stage 2 part 2A** to Category A at an estimated cost of \$272.1 million

in money-of-the-day (MOD) prices.

PROJECT SCOPE

332DS — Lam Tsuen Valley sewerage

2. The part of **332DS** that we propose to upgrade to Category A comprises the construction of —

- (a) about 16 kilometres (km) of sewers for 14 unsewered areas, namely Chuen Shui Tseng, Chung Uk Tsuen, Fong Ma Po, Hang Ha Po, Kau Liu Ha, Ko Tin Hom, Lam Tsuen San Tsuen, Lung A Pai, Pak Tin Kong, San Uk Pai, San Uk Tsai, Tin Liu Ha, Tong Min Tsuen and Wo Tong Pui;
- (b) two sewage pumping stations (SPSs), respectively at Tin Liu Ha and Tong Min Tsuen;
- (c) about 550 metres (m) of twin rising mains in association with construction of the SPSs in (b) above; and

(d) ancillary works.

————— A site plan showing the proposed works is at **Enclosure 1**.

339DS — North District sewerage, stage 1 phase 2C and stage 2 phase 1

3. The part of **339DS** that we propose to upgrade to Category A comprises the construction of —

- (a) about 500 m of gravity trunk sewers along Tai Wo Service Road East;
- (b) about 8.3 km of sewers for three unsewered areas, namely Fu Tei Pai, Ping Kong and Tai Wo;
- (c) two SPSs, respectively at Ping Kong and Tai Wo;
- (d) about 250 m of twin rising mains in association with construction of the SPSs in (c) above; and
- (e) ancillary works.

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

345DS — North District sewerage, stage 2 part 2A

4. The part of **345DS** that we propose to upgrade to Category A comprises the construction of —

- (a) about 2.0 km of gravity trunk sewers along Sha Tau Kok Road (Shek Chung Au Section);
- (b) about 10 km of sewers for nine unsewered areas, namely Muk Min Tau, Nga Yiu Tau, San Tsuen, Shan Tsui, Sheung Tam Shui Hang, Ha Tam Shui Hang, Tsiu Hang, Wu Shek Kok and Yim Tso Ha;
- (c) one SPS at Wu Shek Kok;
- (d) about 300 m of twin rising mains in association with construction of the SPS in (c) above; and
- (e) ancillary works.

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

JUSTIFICATIONS

5. At present, sewage from the 26 unsewered areas mentioned above is often treated and disposed of by means of private treatment facilities (such as septic tanks and soakaway (STS) systems). These facilities are often ineffective in removing pollutants due to their close proximity to watercourses¹ or inadequate maintenance². This is detrimental to the water quality of both the streams nearby and the receiving waters in Tolo Harbour, Deep Bay and Starling Inlet. Environmental hygiene in the vicinity may also be adversely affected.

6. Under the North District Sewerage Master Plan (SMP) and the Tolo Harbour SMP, Environmental Protection Department has planned to extend the sewerage to these 26 unsewered areas as a long-term solution to the above. We have already commenced two associated sewerage projects, namely the construction of trunk sewers and associated facilities in Lam Tsuen Valley and Kau Lung Hang under **364DS “Lam Tsuen Valley sewerage — trunk sewers, pumping station and rising mains”** and **366DS “Kau Lung Hang sewerage — trunk sewers, pumping station and rising mains”** respectively. Both projects are on schedule for completion in the second half of 2012.

7. The proposed works under **332DS**, **339DS** and **345DS** serve to build local networks of branch sewers within each of these unsewered areas and connect them to nearby trunk sewers or treatment facilities. Specifically, we propose to lay about 37.9 km of sewers (including 2.5 km of gravity trunk sewers and 1.1 km of twin rising mains) for collecting and conveying the sewage generated from these areas. We also propose to construct five SPSs to provide sufficient hydraulic gradient for overcoming the topographical constraints along various sections of the sewer alignments.

8. Upon completion of the proposed works and the two associated sewerage projects as mentioned in paragraph 6 above, sewage collected from these 26 unsewered areas will be conveyed to sewage treatment works in Tai Po, Shek Wu Hui or Sha Tau Kok for treatment before disposal. The significant reduction in the amount of pollutants

¹ STS systems operate by allowing the effluent to percolate through gravels whereby pollutants would be removed in a natural manner. However, if the STS system is located in an area where the ground water table is high, such as an area in close proximity to watercourses, it will not be able to function properly due to ineffective percolation.

² Inadequate maintenance of STS systems would affect their pollutant removal efficiency and may even lead to overflow of effluent.

discharged into the receiving waters will bring about sustainable improvements to our water quality.

9. Subject to funding approval of the Finance Committee (FC), Drainage Services Department (DSD) plans to commence construction of the proposed works under **332DS**, **339DS** and **345DS** in the fourth quarter of 2011 for completion by August 2015, November 2015 and December 2015 respectively.

10. We will retain the remainders of **332DS**, **339DS** and **345DS** in Category B, which involve further extension of the sewerage by about 63 km to 38 other unsewered areas in North District and Tolo Harbour catchment. Fundings for the remainders of **332DS**, **339DS** and **345DS** will be sought at a later stage after completion of the design and preparatory work.

FINANCIAL IMPLICATIONS

11. We estimate the capital cost of the proposed works under **332DS**, **339DS** and **345DS** to be \$773.3 million in MOD price made up as follows —

| | \$ million (MOD) |
|---|---------------------|
| (a) 332DS — Lam Tsuen Valley sewerage (<i>part</i>) | 274.4 |
| (b) 339DS — North District sewerage, stage 1 phase 2C and stage 2 phase 1 (<i>part</i>) | 226.8 |
| (c) 345DS — North District sewerage, stage 2 part 2A (<i>part</i>) | 272.1 |
| Total | 773.3 |

12. We estimate that implementation of the proposed works under **332DS**, **339DS** and **345DS** will create a total of 263 jobs (212 for labourers and another 51 for professional / technical staff), providing a total employment of 10 210 man-months. Detailed breakdowns are as follows —

| PWP item no. | (A) | (B) | (A) + (B) | (C) |
|------------------------------|---|---|---|---|
| | Number of jobs to be created for labourers | professional / technical staff | Total number of jobs created | Employment in man-months |
| 332DS (<i>part</i>) | 82 | 20 | 102 | 3 600 |
| 339DS (<i>part</i>) | 63 | 15 | 78 | 3 150 |
| 345DS (<i>part</i>) | 67 | 16 | 83 | 3 460 |
| Total | 212 | 51 | 263 | 10 210 |

PUBLIC CONSULTATION

332DS — Lam Tsuen Valley sewerage

13. We consulted Tai Po Rural Committee (RC) and the Environment, Housing and Works Committee under Tai Po District Council (DC) on 24 July 2007 and 12 March 2008 respectively. Both Committees supported the proposed works.

14. We gazetted the proposed works under Water Pollution Control (Sewerage) Regulation (WPC(S)R) in three schemes between June and November 2009. A total of 26 objections (including one in respect of an amendment scheme) concerning about land resumption issues or service area of the sewerage were received. Having met with the objectors and considered their grounds of objection, we prepared a total of four amendment schemes and all objectors have withdrawn their objections unconditionally after we completed gazettal of these amendment schemes. Since all the objections have been resolved, the Director of Environmental Protection authorised the proposed works between August 2010 and January 2011.

339DS — North District sewerage, stage 1 phase 2C and stage 2 phase 1

15. We consulted the District Development and Environmental Improvement Committee under North DC in respect of the proposed works in Ping Kong and Fu Tei Pai on 23 May 2005. The Committee supported the proposed works in principle, but requested the Administration to consider the comments and concerns raised by members,

particularly on the existing arrangement that individual small house owners would need to complete the house-to-sewerage connection works for their premises at their cost. We attended subsequent meetings of the Committee on 18 July 2005 and 26 September 2005, as well as the meetings of North DC on 13 October 2005 and 9 December 2005 to explain the arrangements. At these meetings, we highlighted that the Government has all along been committed to improving the environment in rural areas and accepted to bear the capital cost of extending the public sewerage to serve more areas. The house-to-sewerage connections, however, would be made for exclusive use by the occupants. All sewer connection works within a lot boundary and associated maintenance are private works that are the responsibility of the house owner. This arrangement has been applied to all property owners in Hong Kong on equal basis for years. Where feasible, our aim is to provide the branch sewer up to the lot boundary of a small house so as to facilitate the owner to carry out the house-to-sewerage connection works as far as possible.

16. We also consulted Tai Po RC and the Environment, Housing and Works Committee under Tai Po DC on 11 May 2007 and 14 September 2007 in respect of the proposed works in Tai Wo. Both Committees supported the proposed works.

17. We gazetted the proposed works under WPC(S)R in four schemes between April 2008 and August 2009. No objections were received in respect of three schemes and they were subsequently authorised between August 2008 and January 2011. The remaining scheme received three objections concerning about land resumption and sewer alignment issues of the proposed works in Ping Kong. Having met with the objectors and considered their grounds of objection, we prepared a total of three amendment schemes and all objectors have withdrawn their objections unconditionally after we completed gazettal of these amendment schemes. Since all the objections have been resolved, the Director of Environmental Protection authorised the proposed works in September 2009.

345DS — North District sewerage, stage 2 part 2A

18. We consulted Sha Tau Kok District RC and the District Minor Works and Environmental Improvement Committee under North DC on 4 June 2009 and 13 July 2009. They both had no objection to the proposed works in principle, and requested DSD to continue engaging the locals to address their views on the scope of the project and the implementation arrangements with respect to the house-to-sewerage connection works.

We have been engaging village representatives in subsequent stages of finalising the sewer alignments, and DSD will continue to liaise closely with them throughout the construction stage.

19. We gazetted the proposed works under WPC(S)R in seven schemes between January and March 2011. No objections were received in respect of the first five schemes and they were subsequently authorised in April and May 2011. Subject to the outcome of gazettal, authorisation of the remaining two schemes is tentatively scheduled in early June 2011.

HERITAGE IMPLICATIONS

20. The proposed works under **332DS**, **339DS** and **345DS** will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by Antiquities and Monuments Office. For the proposed works under **345DS**, the Preliminary Environmental Review (PER) has identified that several proposed sewers will be located in vicinity of some village houses currently situated at one site of archaeological interest. Appropriate mitigation measures will be implemented in accordance with recommendations of the PER.

LAND ACQUISITION

21. We have to resume a total of 500 private agricultural lots (about 19 750 square metres (m²)) for carrying out the proposed sewerage improvement works, among which 338 lots (about 10 970 m²), 112 lots (about 6 640 m²) and 50 lots (about 2 140 m²) are for the proposed works under **332DS**, **339DS** and **345DS** respectively. The land resumption and clearance will not affect any households or structures.

ENVIRONMENTAL IMPLICATIONS

22. The proposed works under **332DS**, **339DS** and **345DS** are not designated projects under Environmental Impact Assessment Ordinance (Cap. 499). We have completed PERs for the proposed works and concluded that, with appropriate mitigation measures in place, they would not have any long-term adverse environmental impact.

23. For short-term environmental impacts during construction, we

will control noise, dust and site run-off to within the established standards and guidelines through implementation of environmental mitigation measures, such as the use of silenced construction equipment and noise barriers 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 regular site inspections to ensure that these recommended mitigation measures and good site practices will be properly implemented on site. We have included a sum of \$5.7 million, \$4.2 million and \$4.5 million (in September 2010 prices) in the project estimates of the proposed works under **332DS**, **339DS** and **345DS** respectively for implementing these environmental mitigation measures.

24. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. For example, in addition to the need for meeting hydraulic and traffic requirements, we have also designed the alignment of the proposed sewerage works in such a manner that excavation and demolition of existing structures will be minimised. In addition, we will require the contractors to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities (PFRF)³. 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.

25. At the construction stage, we will require the contractors 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 contractors 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 at PFRF and landfills respectively through a trip-ticket system.

26. We estimate that the proposed works will generate about 144 330 tonnes of construction waste in total (38 160 tonnes, 48 370 tonnes and 57 800 tonnes for the proposed works under **332DS**, **339DS** and **345DS** respectively). Of these, we will reuse 81 055 tonnes (56.2%)

³ PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

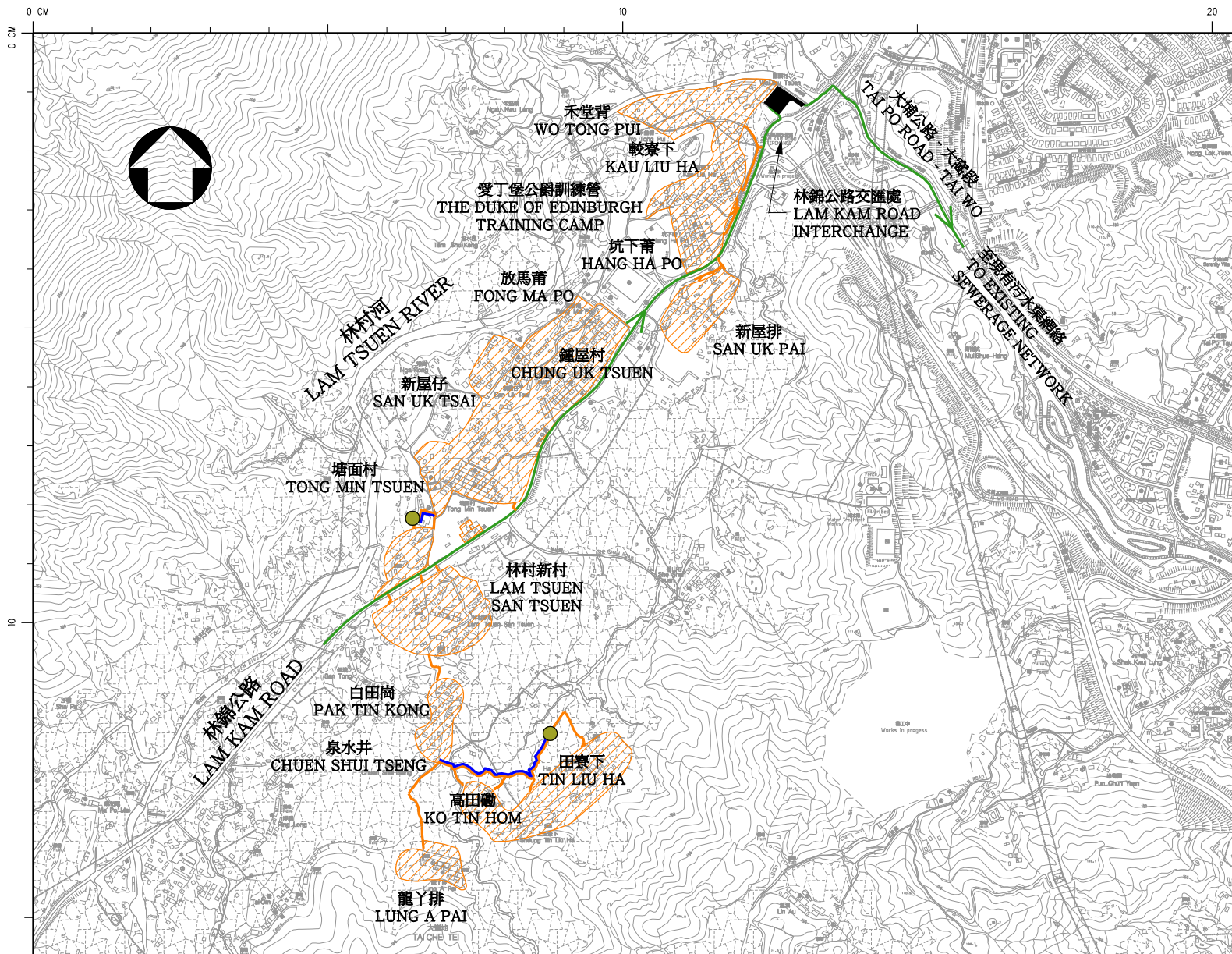
of inert construction waste on site and deliver another 59 815 tonnes (41.4%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 3 460 tonnes (2.4%) of non-inert construction waste at landfills. The total cost of accommodating construction waste at PFRF and landfill sites is estimated to be about \$0.57 million, \$0.94 million and \$0.54 million for the proposed works under **332DS**, **339DS** and **345DS** respectively (based on a unit cost of \$27 per tonne for disposal at PFRF and \$125 per tonne⁴ at landfills).

ADVICE SOUGHT

27. Members are invited to support our proposals for upgrading the proposed works under **332DS**, **339DS** and **345DS** to Category A. Subject to Members' advice, we plan to submit our proposals for endorsement by the PWSC in June 2011 with a view to seeking FC's funding approval in July 2011.

Environmental Protection Department
Drainage Services Department
May 2011

⁴ The 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 per m³), nor the cost to provide new landfills (which is likely to be more expensive), when the existing ones are filled.



LEGEND:

擬建工程

PROPOSED WORKS



擬建的鄉村污水收集系統範圍

PROPOSED VILLAGE SEWERAGE AREA



擬建的污水泵房

PROPOSED SEWAGE PUMPING STATIONS



擬建的加壓污水管

PROPOSED RISING MAINS



擬建的污水渠

PROPOSED SEWERS

相關工程 (項目364DS)

RELATED WORKS (ITEM 364DS)

(建造中 UNDER CONSTRUCTION)



無壓污水幹渠

GRAVITY TRUNK SEWERS



林村谷污水泵房

LAM TSUEN VALLEY
SEWAGE PUMPING STATION

圖則名稱 drawing title

工務計劃項目第332DS號 — 林村谷污水收集系統
PWP ITEM No.332DS - LAM TSUEN VALLEY SEWERAGE

繪畫 drawn

T.M. SIU

日期 date
25 MAR 2011

核對 checked

W.C. YIP

日期 date
25 MAR 2011

批核 approved

H.S. KAN

日期 date
25 MAR 2011

部門 office

工程管理部
PROJECT MANAGEMENT DIVISION

圖則編號 drawing no.

DPM/332DS0/0008

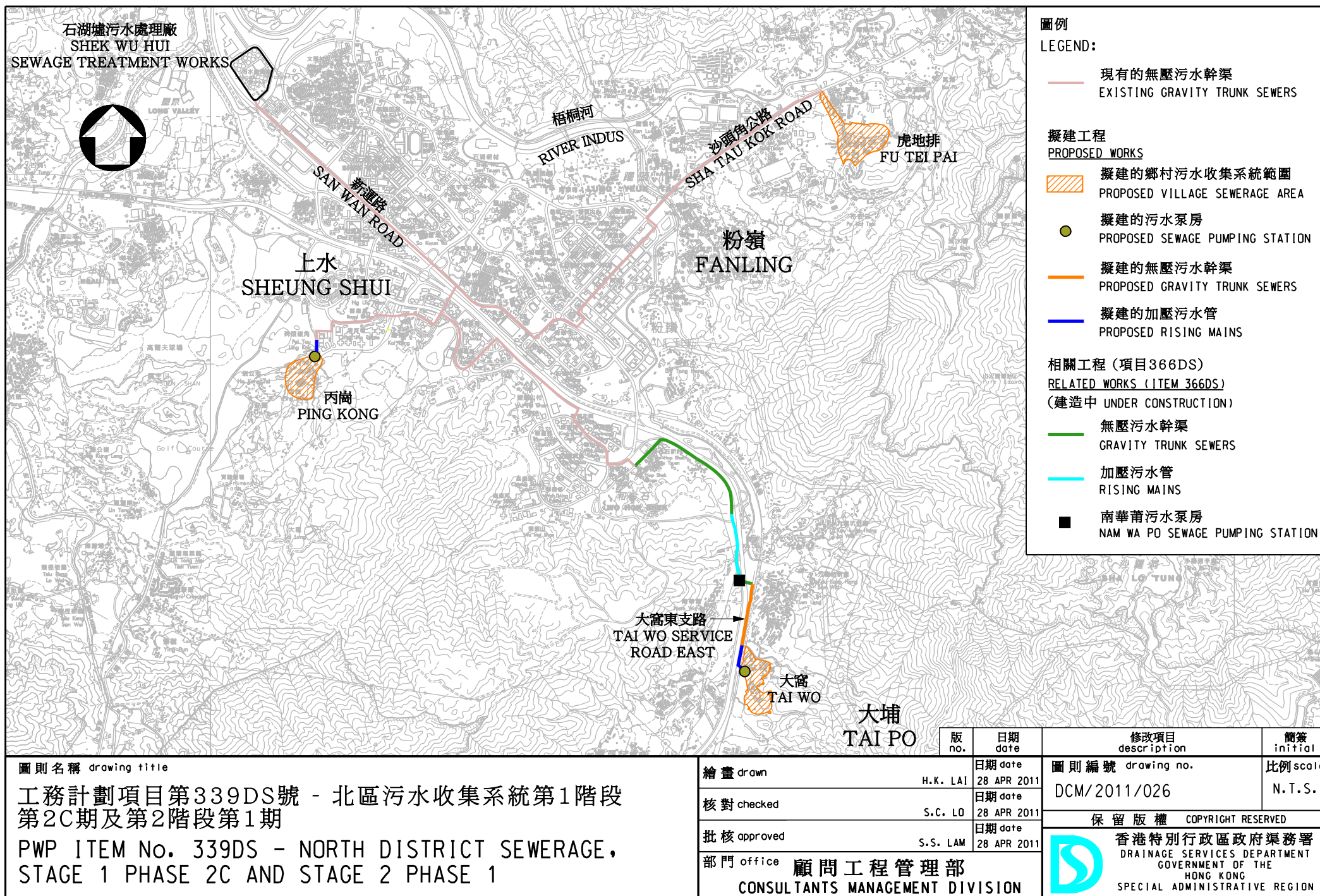
比例 scale

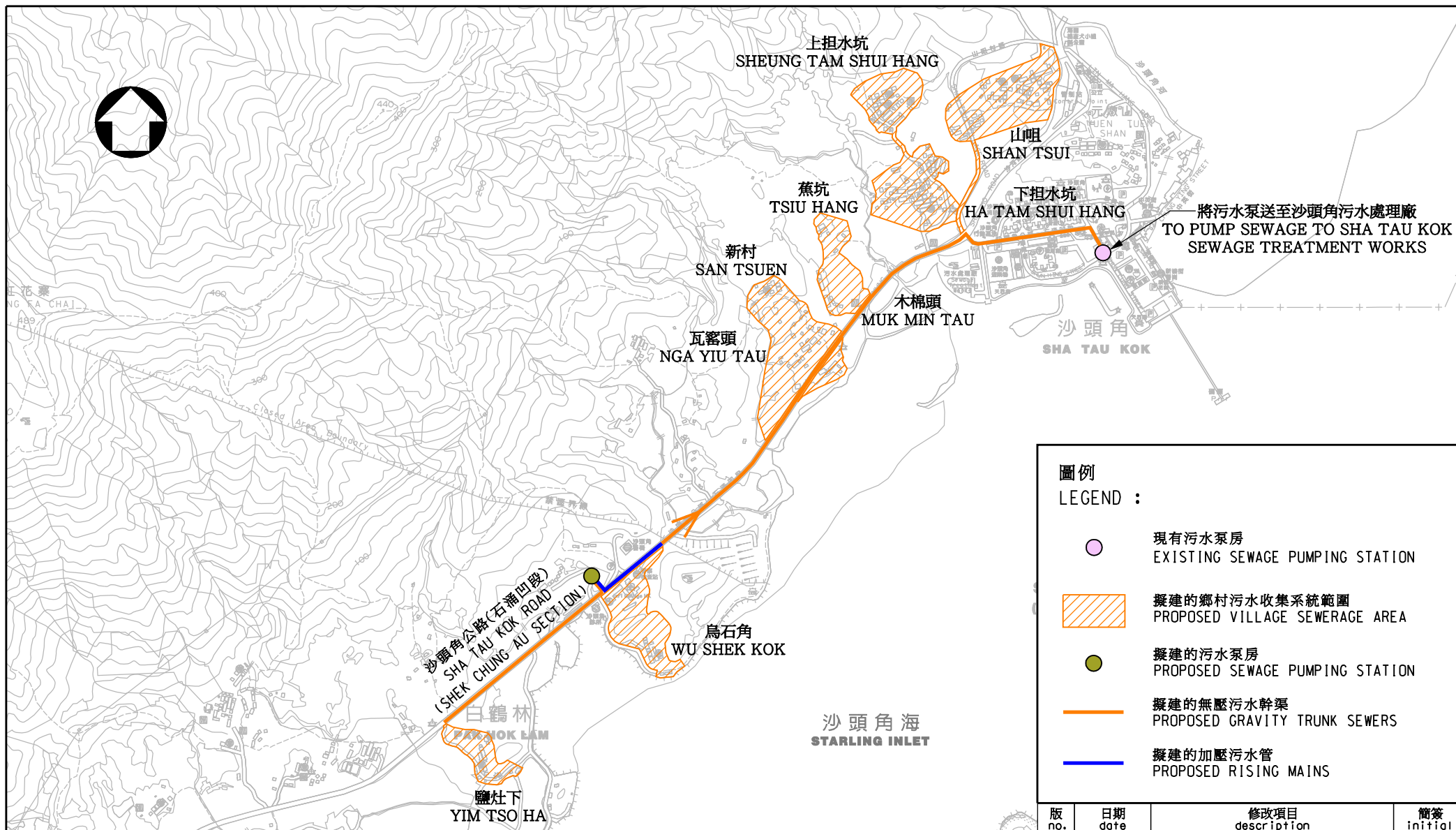
N.T.S.

保留版權 COPYRIGHT RESERVED



香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION





| | | | | | | | |
|-------------|--|---------|-------------|---|--------------|------------|----------|
| 繪畫 drawn | H. K. LAI | 日期 date | 14 MAR 2011 | 圖則編號 drawing no. | DCM/2011/006 | 簡簽 initial | 比例 scale |
| 核對 checked | S. K. LO | 日期 date | 07 APR 2011 | | | | N.T.S. |
| 批核 approved | S. S. LAM | 日期 date | 07 APR 2011 | 保留版權 COPYRIGHT RESERVED | | | |
| 部門 office | 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION | | | 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION | | | |