

Legislative Council Panel on Development

189WC – Replacement and rehabilitation of water mains, stage 4 phase 2

PURPOSE

This paper briefs Members on the proposal to upgrade the remainder of **189WC** to Category A, entitled “Replacement and rehabilitation of water mains, stage 4 phase 2”, at an estimated cost of \$4,510.3 million in money-of-the-day (MOD) prices for the implementation of the second phase of stage 4 of the water main replacement and rehabilitation (R & R) programme.

PROPOSAL

2. The proposed upgrading of the remaining part of **189WC** to Category A comprises the R&R of water mains in various districts as shown in **Enclosure 1** and is summarised below –

- (a) about 302 kilometres (km) of fresh water mains ranging from 20 to 2 300 millimetres (mm) in diameter including the associated service pipes and connections; and
- (b) about 48 km of salt water mains ranging from 25 to 1 200 mm in diameter including the associated service pipes and connections.

3. Subject to the approval of the Finance Committee (FC), we plan to commence the proposed works in January 2012 for completion in December 2015.

JUSTIFICATION

4. The local fresh water and salt water supplies are provided through a network

of about 7 800 km of water mains. Most of these water mains are underground, and a substantial portion of them were laid more than 30 years ago. They are approaching the end of their serviceable life and have become increasingly difficult and costly to maintain. As a result of their ageing, there had been an increasing number of main bursts and leakages causing inconvenience to the public and loss of precious water resources. To prevent deterioration of the water supply network, we started implementing a territory-wide programme in 2000 for R&R of some 3 000 km of aged water mains in four stages.

5. After eleven years of implementation, the R & R programme has achieved steady progress and is approaching the final stage. With the R & R works completed so far, coupled with the proactive leakage control and pressure management measures, the annual number of main bursts has decreased from the peak of about **2 500** in 2000/01 to **609** in 2010/11 as shown in **Enclosure 2**. For 2011/12, from 1 April 2011 to 30 September 2011, there are **212** incidents of main bursts. The water main leakage rate has also been reduced from **25%** in 2001 to **20%** in 2010. We anticipate that the leakage rate will further decrease to **15%** upon completion of the R & R programme in 2015.

FINANCIAL IMPLICATIONS

6. We estimate that the cost of the proposed works to be \$4,510.3 million in MOD prices made up as follows –

	\$ million
(a) Water main replacement by	2,245.0
(i) conventional method ¹	1,470.0
(ii) trenchless methods ²	775.0

¹ Water main replacement by conventional method refers to laying of new water mains in trench. It involves opening up road surface for the whole lengths of the pipelines being replaced. For budgetary purpose, based on site investigation results, we have assumed that around 83% of water mains under stage 4 phase 2 will be replaced by conventional method. The actual percentage will depend on site conditions.

² Water main replacement by trenchless methods (sometimes referred to as ‘minimum dig’ or ‘reduced dig’ methods) refers to the use of pipe jacking, micro-tunnelling or boring techniques to construct underground pipelines without opening up road surface for the whole lengths of the pipelines being replaced. For budgetary purpose, based on site investigation results, we have assumed that around 4% of water mains under stage 4 phase 2 will be replaced by trenchless methods. The actual percentage will depend on site conditions.

	\$ million
(b) Water main rehabilitation ³ by trenchless methods	790.0
(c) Environmental mitigation measures	30.0
(d) Consultants' fees for	39.0
(i) contract administration	5.0
(ii) management of resident site staff	34.0
(e) Remuneration of resident site staff	301.0
(f) Contingencies	340.0
Sub-total	3,745.0 (in September 2011 prices)
(g) Provision for price adjustment	765.3
Total	4,510.3 (in MOD prices)

7. The proposed works will not give rise to additional recurrent expenditure.

PUBLIC CONSULTATION

8. We consulted the concerned District Councils (DC) in mid-2010 and July-2011 on the proposed works and all DCs supported the project. A table showing the consultation result is at **Enclosure 3**. We will implement suitable traffic and environmental mitigation measures under the works contracts to minimise the

³ Water main rehabilitation refers to the launch of a new pipe from a 'launching pit' and pulling it inside the existing pipe route to a 'receiving pit'. Trenchless methods are adopted without opening up the road surface except at the pits. For budgetary purpose, based on site investigation results, we have assumed that around 13% of water mains under stage 4 phase 2 will be rehabilitated by trenchless methods. The actual percentage will depend on site conditions.

inconvenience to the public. We will also closely monitor the implementation of these mitigation measures and the interfacing of the proposed works with works in the proximity, and will consult relevant DCs as necessary.

ENVIRONMENTAL IMPLICATIONS

9. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap 499). The project will not cause long-term environmental impact. We have included in the project estimates the cost to implement suitable mitigation measures to control short term environmental impacts.

10. During construction, we will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contract. These include the use of silencers, mufflers, acoustics lining or shields for noisy construction activities, frequent cleaning and watering of the site, and provision of wheel-washing facilities.

11. At the planning and design stages, we have considered the alignments of the proposed water mains to reduce the generation of construction waste where possible. 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 facilities⁴. We will require the contractors to maximise the use of recycled / recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

12. 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 public fill reception facilities and landfills respectively through a trip-ticket system.

⁴ 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 filling reception facilities requires a licence issued by the Director of Civil Engineering and Development.

13. We estimate that the project will generate in total about 481 000 tonnes of construction waste. Of these, we will reuse about 267 000 tonnes (55.5%) of inert construction waste on site and deliver 207 000 tonnes (43.0%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 7 000 tonnes (1.5%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$6.5 million for this project (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne⁵ at landfills).

HERITAGE IMPLICATIONS

14. The proposed works will be carried out at various locations in Kowloon, New Territories and Outlying Islands. The proposed works in Kowloon will not affect any heritage sites, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office (AMO). For the proposed works in the New Territories and Outlying Islands, some of the proposed alignments fall within sites of archaeological interest. A Heritage Impact Assessment (HIA) and an Environmental Review (ER) have been conducted for works in the New Territories and Outlying Islands respectively during the investigation phase. The HIA and ER concluded that the proposed works will not cause adverse impact on sites of archaeological interest. We will conduct archaeological watching brief during excavation as a precautionary measure according to the recommendation of the Final HIA report approved by AMO and the Final ER Report.

TRAFFIC IMPLICATIONS

15. We have carried out traffic impact assessments (TIAs) for the proposed works. The cumulative effects of traffic generated by projects at adjacent sites are also covered in the TIAs. The TIAs have concluded that the proposed works would not cause any significant traffic impact to the surrounding road network. Nonetheless, we will implement temporary traffic arrangements to minimise the impact on traffic during

⁵ 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 per m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

construction and will display notice boards on site to explain the reason of temporary traffic arrangements and the expected completion dates of the individual sections of works. In addition, we will set up telephone hotlines for public enquiries or complaints. Furthermore, trenchless methods will be adopted as needed for works along busy roads.

LAND ACQUISITION

16. The proposed works do not require any land acquisition.

BACKGROUND INFORMATION

17. The R & R programme was originally planned for implementation in stages from 2000 to 2020. In response to the public aspiration for early completion of the project, we compressed the works programme in 2005 and advanced the target completion date of the entire project to 2015.

18. The R&R programme is implemented in four stages. Stage 1 and stage 2 involve R&R of water mains of 600 km and 750 km respectively and were substantially completed in early 2010 and mid 2011 respectively. Stage 3 involves R&R of water mains of 800 km, and 43% of the works were completed as at September 2011. We expect to complete stage 3 by December 2013.

19. As regards stage 4 which involves R&R of water mains of 850 km in two phases, we upgraded **189WC** to Category B in January 2008. In July 2008, we upgraded part of **189WC** to Category A as **190WC** “Replacement and rehabilitation of water mains, stage 4 – investigation and detailed design” for engagement of consultants to carry out investigation and detailed design of the proposed works. In February 2011, we upgraded another part of **189WC** to Category A as **191WC** “Replacement and rehabilitation of water mains, stage 4 phase 1” for carrying out R&R of water mains of 500 km. Construction of stage 4 phase 1 works commenced in March 2011 for completion in December 2015. The remainder of **189WC** was retained in Category B and was retitled “Replacement and rehabilitation of water mains, stage 4 phase 2”.

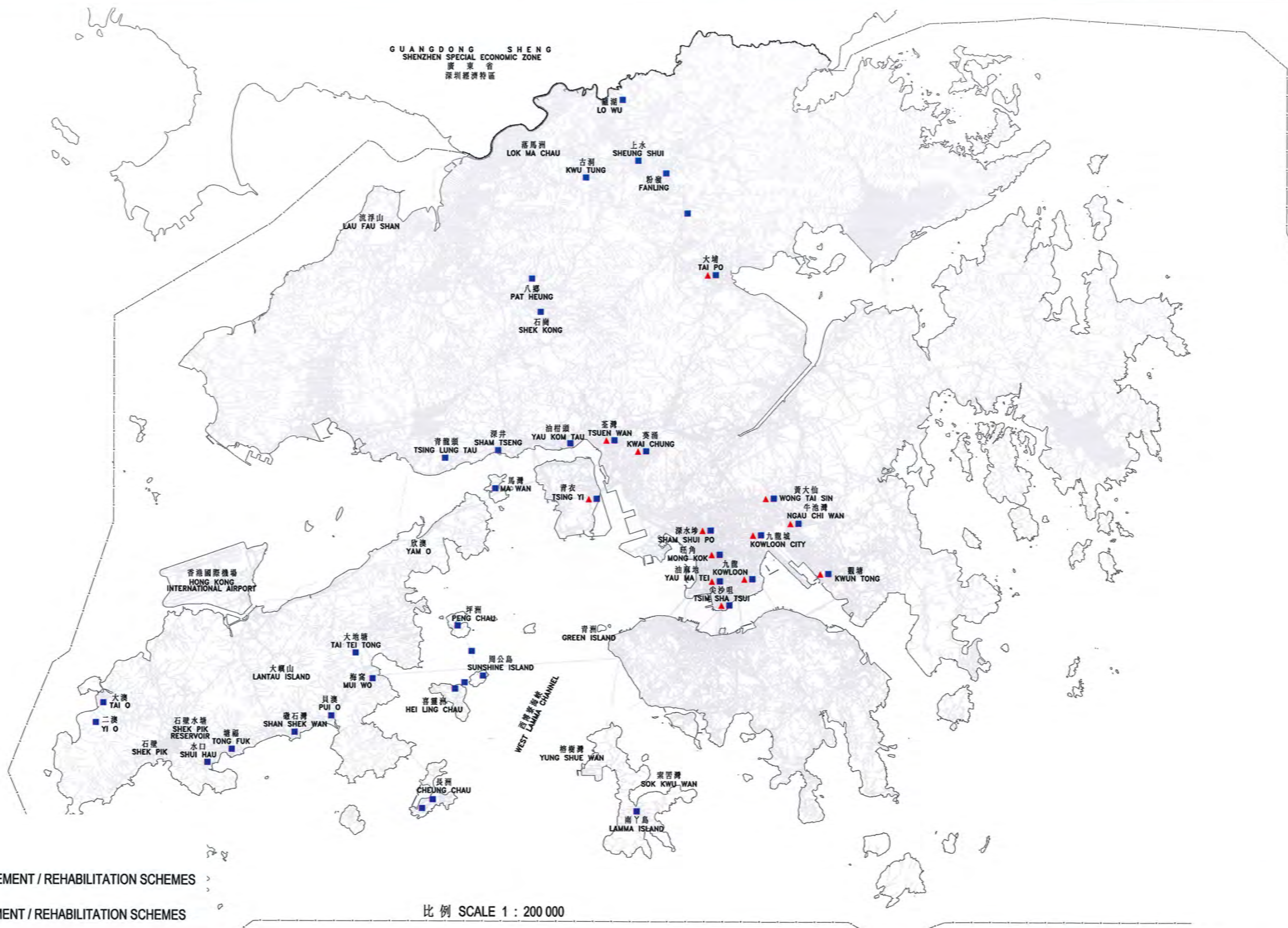
20. The design of the proposed works for stage 4 phase 2 as detailed in paragraph 2 (a) and (b) above has been completed. Subject to FC’s approval, we plan to commence the construction in January 2012.

21. The proposed works will not require felling of any tree.
22. We estimate that the proposed works will create about 1 200 jobs (970 for labourers and another 230 for professional/technical staff) providing total employment of 50 670 man-months.

WAY FORWARD

23. We intend to seek the support of the Public Works Subcommittee for upgrading the remainder of **189WC** to Category A in December 2011 with a view to seeking funding approval from FC in January 2012.

Development Bureau
Water Supplies Department
November 2011



圖例 LEGEND:

- 食水管更換/修復計劃
FRESH WATER MAINS REPLACEMENT / REHABILITATION SCHEMES
- ▲ 海水管更換/修復計劃
SALT WATER MAINS REPLACEMENT / REHABILITATION SCHEMES

比例 SCALE 1 : 200 000

核准 APPROVED

[Signature]
總工程師/工程管理 CE / PM

3 / 10 / 2011

(甲級工程)
(CAT 'A' Submission)

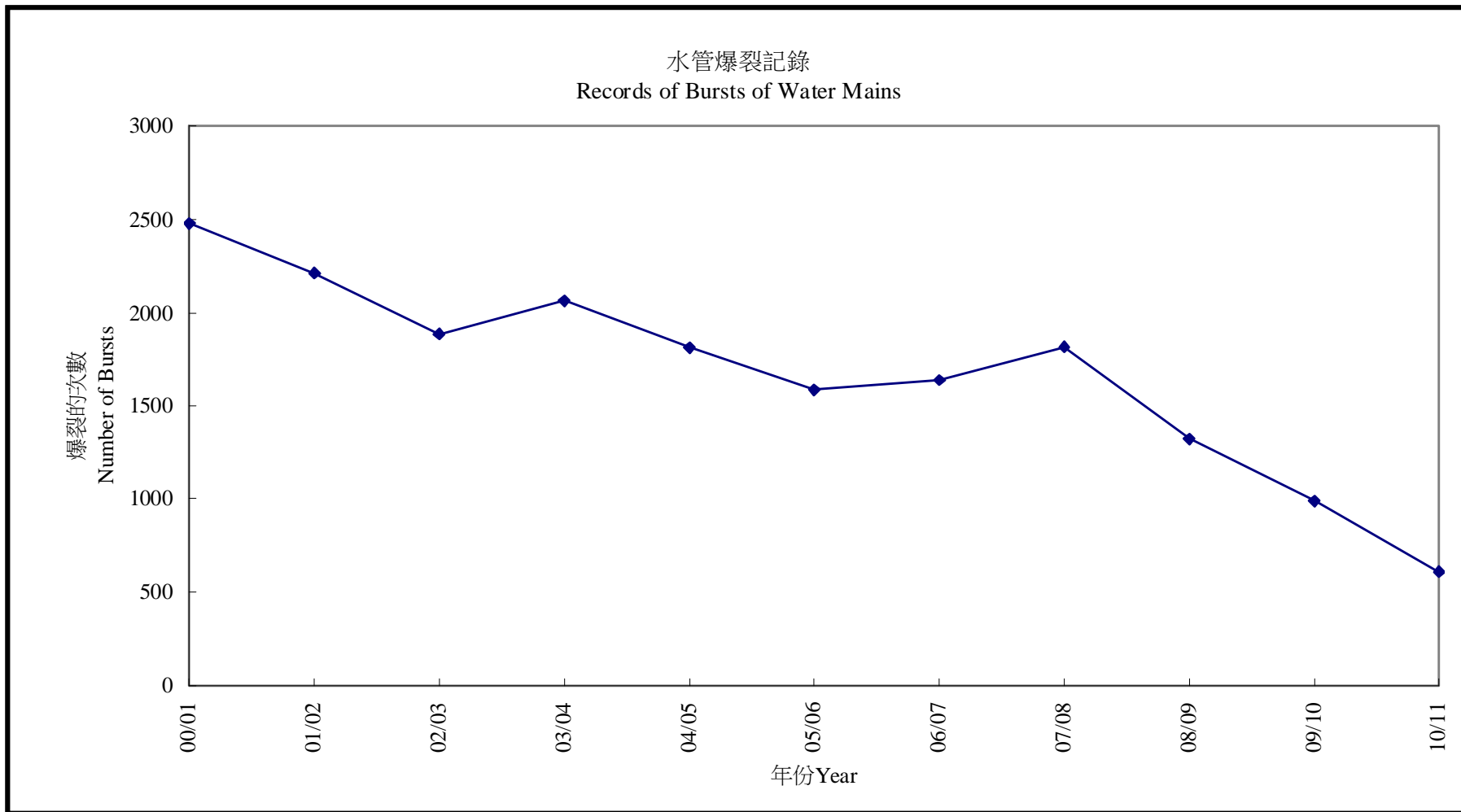
工務計劃工程項目第 189WC 號 ----- 更換及修復水管工程第 4 階段第 2 期
P.W.P. Item no. 189WC ----- Replacement and rehabilitation of water mains, stage 4 phase 2



水務署
WATER SUPPLIES DEPARTMENT

草圖編號
SKETCH NO.

SK 62011 / 034



189WC – Replacement and rehabilitation of water mains, stage 4 phase 2**Consultation with District Councils**

District Council	Date of Meeting	Decision
Tai Po District Council Environment, Housing and Works Committee	14 July 2010	Supported
Yuen Long District Council Town Planning and Development Committee	14 July 2010	Supported
North District Council District Minor Works and Environmental Improvement Committee	19 July 2010	Supported
Wong Tai Sin District Council Traffic and Transport Committee	27 July 2010	Supported
Sham Shui Po District Council Transport and Housing Affairs Committee	29 July 2010	Supported
Kwai Tsing District Council Traffic and Transport Committee	12 August 2010	Supported
Tsuen Wan District Council Environmental and Health Affairs Committee and Traffic and Transport Committee,	2 September 2010 and 6 September 2010	Supported
Yau Tsim Mong District Council Traffic and Transport Committee	9 September 2010	Supported
Kowloon City District Council Housing and Infrastructure Committee	16 September 2010	Supported
Kwun Tong District Council Traffic & Transport Committee	7 October 2010	Supported
Islands District Council Agriculture, Fisheries and Environmental Hygiene Committee	18 July 2011	Supported