

Consultation Paper

PWP No.174WC

Replacement and Rehabilitation of Water Mains, Stage 1 Phase 2

1. PURPOSE

The purpose of this paper is to present to Members on the proposed replacement and rehabilitation of water mains to be carried out in Yau Tsim Mong District under this project and seek Members' support for the proposed works to proceed.

2. BACKGROUND

- 2.1. Hong Kong's fresh water and salt water supplies are provided through a network of water mains, approximately 7,200 kilometers (km) in length and about 45% of them were laid more than 30 years ago. Since they are approaching the end of their useful life and are becoming increasingly difficult and expensive to maintain, frequent main burst and leakage become more serious in recent years, which affect traffic, waste potable water and cause inconvenience to public.
- 2.2. Water Supplies Department (WSD) formulated a replacement and rehabilitation programme for water mains to improve the reliability of the water supply system and to enhance the performance of the water supply. The Stage 1 Phase 1 works have commenced and anticipated to be completed by the end of 2008.
- 2.3. The Stage 1 Phase 2 works in Kowloon will soon commence and replace and rehabilitate 109 km existing fresh and salt water mains, in order to enhance the water supply system.

Based on previous investigation, many water mains within the area are aged and there is a trend that main burst and leakage will occur more frequently. Therefore, replacement and rehabilitation of these aged water mains is necessary.

- 2.4. Water Supplies Department commissioned Maunsell – Metcalf & Eddy Joint Venture to undertake the detailed design and construction of the Stage 1 Phase 2 works in Kowloon area. As part of the assignment, the Consultant has also reviewed the recommendations and impact assessments made in the Investigation Report.

- (c) Term contract will be adopted for the works. Works order will be issued in accordance with the working and traffic conditions so that the progress and duration of works can be effectively controlled;
- (d) To carry out an environmental review to identify means to reduce environmental impacts to the absolute minimum. Please refer to Section 7 for details; and
- (e) To consult affected public and residents, and to notify the consumers before suspension of water supply. It will be specified in the contract that the maximum duration of water supply suspension is restricted to be 8 hours.

5.3. An abstract of the notes of the Yau Tsim Mong District Council Meeting is included in Appendix A.

6. TRAFFIC IMPACT

6.1. A Traffic Impact Assessment (TIA) was carried out in the Investigation Stage to identify the potential impact on traffic due to construction of the works. The findings were further reviewed and supplemented by a TIA necessary for the works. The assessment indicated that the traffic impact due to the proposed works is within the acceptable level. It can be mitigated with implementation of the temporary traffic management scheme. In addition, trenchless / minimum dig techniques would be employed to minimize the traffic impact if it is technically feasible.

6.2. The study has also recommended a set of temporary management measures to minimize the impact of road opening works on both vehicular and pedestrian traffic operations during construction. The following guidelines have been followed in developing the temporary traffic management measures –

- (i) Capacity assessment has been carried out to assess the impacts due to temporary lane closure and lane narrowing during construction to ensure that requirements stipulated by Transport Department are satisfied;
- (ii) Feasible, safe and adequate traffic management measures in accordance with the Code of Practice for Lighting, Signing and Guarding of Road Works have been proposed; and
- (iii) All vehicular accesses, pedestrian crossing facilities and the existing public transport operation will be maintained throughout the construction period. All excavation works crossing the vehicular accesses will be backfilled or covered with steel plate if necessary.
- (iv) Lane closure will inevitably be necessary during part of the proposed mainlaying works. However, all the existing traffic movements should be maintained as far as possible.
- (v) Construction would be carried out on a lane by lane basis, with each section not exceeding 60 m in length. A minimum separation

Road Junction	Proposed TTM Schemes / Mitigation Measures
Ivy Street / Tai Kok Tsui Road	Trenchless Method has been recommended. One lane closure will be required at Tai Kok Tsui Road. The junction will perform satisfactory during construction stage. Opening of working pits is acceptable.
Argyle Street / Ferry Street	Trenchless Method has been recommended. One lane closure will be required at both Ferry Street and Cherry Street. The junction will perform satisfactory during construction stage. Opening of working pits is acceptable.
Shanghai Street / Kansu Street	Lane by lane closure will be required at Kansu Street westbound. The junction will perform satisfactory during construction stage. Open-cut excavation is acceptable.

6.4. In 2003, we have consulted Transport Department, Highways Department and Hong Kong Police Force on the TIA results and the proposed temporary traffic management. They have in general no adverse comment on the traffic aspects. We shall liaise closely with the relevant transport authorities during the construction stage and shall minimize any traffic impacts.

7. ENVIRONMENTAL REVIEW

7.1. In the environmental study carried out at the Investigation Stage, air quality, noise, water quality, waste and ecological impacts have been assessed. The assessment criteria followed all relevant statutory requirements. Environmental Protection Department (EPD) has vetted the environmental assessment report and has agreed that Environment Impact Assessment will not be necessary for the proposed works. EPD agreed with the findings and conclusions in the report and have approved the mitigation measures proposed. An environmental review has been carried out in the Detailed Design Stage and the result is consistent with that in the environmental assessment report.

7.2. Based on the findings of the environment reviews, no insurmountable environmental impact is expected for both the construction and operation phase of the project. Key findings of the reviews and the mitigation measures proposed are described as follows.

9. METHODOLOGY

- 9.1. Traditionally, deteriorated water mains were replaced by laying new water mains alongside the existing mains by trenching method. This method involves excavating a trench of the full length of the existing water main.
- 9.2. In recent years, Water Supplies Department started to use trenchless techniques in replacing the water mains, which effectively reduce the extent of trench excavation and hence the disruption to general public. Details of those methods are included in Appendix D. Therefore, trenchless techniques will be adopted in areas where traffic or environmental effects are of major concerns. However, there are limitations in the techniques, such as excavation for launching pits, tee connections and bend installations. The choice of technique depends on various factors, including the site condition, construction constraints, choice of materials and impact to traffic and environment. In Yau Tsim Mong District, the percentage of pipes to be replaced / rehabilitated using open cut and trenchless methods are 80% and 20% respectively.

10. LAND RESUMPTION

No private land resumption is required as the proposed water mains are to be laid on public roads, footpaths and government lands.

11. CONSTRUCTION PROGRAMME

The proposed works under this Project are scheduled to be undertaken between August 2006 and March 2010. The programme allows for full compliance with all statutory procedures. Road opening will be carried out section by section in a co-ordinated manner to suit the actual traffic conditions.

12. PUBLIC CONSULTATION

We will report to the District Council periodically in order to maintain close liaison with public and smoothen the project progress. If it is necessary, we will attend local consultation activities, provide detailed information of the proposed works and the affected area, understand and respond to the public on the concerned matters. We will also attend to the comments and handle the complaints made by the public so that the condition can be improved promptly. We welcome any comments / suggestions from the District Members at any time in respect of the works.

Water Supplies Department
August 2005

議程五：更換及修復水管工程第一階段第一期及第二期工程
(油尖旺區議會第 57/2002 號及 58/2002 號文件)

主席介紹水務署工程管理部高級工程師張潤康先生和工程師魏文輝先生、顧問工程管理部高級工程師陳儉立先生和工程師劉偉良先生、美華集團-安建顧問聯營公司技術總監麥偉隆先生、工程師何倩芝小姐和交通工程師周仁傑先生，以及博威工程顧問有限公司高級工程師仇尹樂先生和助理工程師林成富先生。

水務署張潤康先生向議員簡介擬在區內進行的更換及修復水管工程的背景、規模和進展情況，並表示該署將於短期內向立法會工務小組申請撥款，以實施第一階段第一期工程。預計工程在 2003 年展開，並於 2006 年完成。為減輕工程對居民的影響，水務署將盡量以「無開掘技術」進行工程。

美華集團-安建顧問聯營公司代表何倩芝小姐介紹第一階段第一期工程的施工範圍、環境和交通影響評估，以及相關的紓緩措施。何小姐略述擬實施臨時交通措施的地點和安排，以及與更換及修復水管工程同期進行的其他工程和協調方法。該公司另一名代表麥偉隆先生則講述「無開掘技術」的特點和好處。

黎自立議員詢問經修復的水管可使用多久。馬力議員指出，由於尖沙咀區現正實施多項道路工程，交通因此十分擠塞。馬力議員憂慮更換及修復水管工程會引致當區交通擠塞情況惡化。張元興議員詢問第一階段第一期工程會否與區內其他工程配合。張潤康先生回應議員的提問時表示，估計上述修復工程完成後，水管可使用 50 年左右。至於尖沙咀區的工程，則會由運輸署成立的專責小組負責協調，以減輕工程對交通造成的影響；此外，水務署亦會積極配合渠務署在區內實施的工程，以減少滋擾。

陳國明議員關注施工期間所產生的噪音對附近學校造成的滋擾。而葉樹安議員則關注施工期內供水會否受影響，並促請當局避免長時間停止供水，令居民感到不便。副主席關注在施工階段產生的噪音和環境衛生問題以及對居民的滋擾，並要求當局妥善監管施工情況，以確保工地清潔衛生而且施工情況進展良好。麥偉隆先生回應說，水務署引進的「無開掘技術」會大大減少噪音工程的滋擾，但該署仍會與學校保持聯絡，以確保更換及修復水管工程不會影響學校的運作。至於在後巷進行的工程，由於只須使用小型機器，故不會造成噪音滋擾，水務署亦在合約中訂立條款，監督工程進度及工地衛生等問題。張潤康先生補充說，水務署承諾每次停止供水都不會超過 8 小時，並會於事前通知有關大戶住戶，以減少居民的不便。

黃志明議員詢問水務署會否考慮分段更換及修復區內的水管，以配合其他部門進行的道路開掘工程，這樣，該署便無須推行大型工程計劃。張潤康先生表示，由於該署有需要考慮整個

Appendix B – Noise Sensitive Receiver

Yau Tsim Mong District

Tai Kok Tsui area

- Tai Kok Tsui Catholic Primary School
- The Church of Christ in China Kei Tsun Primary School
- The Church of Christ in China Hong Kong Council Ming Kei College
- Sharon Lutheran School

Mongkok area

- Tong Mei Road Government Primary School
- SKH Bishop Kei Wing Primary School

Jordan area

- Tak Sun School
- Jordan Road Government Primary School

Tsim Sha Tsui area

- Rosary Church
- Tsim Sha Tsui Baptist Church
- Tsimshatsui Swatow Christian Church

Appendix D – Brief Description of Trenchless Techniques

There are several trenchless (or minimum dig) techniques available in replacement or rehabilitation of water mains. In these techniques, a new pipe is 'launched' from a pit and travels along the existing pipe route to receiving pit. Under ideal conditions, a pipe can travel up to about 100 metres. There are, however, limitations in the techniques. In practice, bends in the existing water mains would shorten the length of water main to be rehabilitated. Apart from the pits required to 'launch' the new pipe, it is necessary to reconnect the existing tees and have, therefore, resulted in opening of small pits. Trenchless techniques are sometimes referred to as 'no dig'. This is misleading. Minimum dig or 'reduced dig' (as compared with traditional open cut method) is a more accurate term. The followings are some brief descriptions of the techniques –

(a) Pipe Bursting

In pipe bursting, a pneumatic or hydraulic bursting tool is forced through the inside of an existing water main causing it to burst. Fragments of the existing water main are pushed into surrounding soil by a spreader and a new pipe is installed in the vacated space. The new pipe may, if required, be slightly larger than the old pipe. This technique can be used with most pipe types up to 250 millimetres in diameter.

(b) Slip lining

Slip lining involves the insertion into the existing water main of a single continuous pipe or jointed sections of pipe. The technique can be used for most pipe diameters. Pre-sterilised rolls of pipe are available in diameter up to 180 millimetres. The use of pre-sterilised pipe enables customers to be re-connected to water supply quickly.

(c) Close fit lining

Close fit lining technique involves the insertion of a temporarily reduced diameter or re-shaped pipe into an existing water main. The inserted pipe will be inverted to its original size on completion of the insertion process. These techniques rely on the flexibility and toughness of polyethylene pipe to revert to its original size after being deformed. There is a small reduction in internal pipe diameter.