

**Supplementary Information Note for  
LegCo Panel on Planning, Lands and Works  
090WC - Replacement and Rehabilitation of  
Water Mains, Stage 1 Phase 1**

The Panel discussed the above project at its meeting on 13 May 1999. This note provides supplementary information on the project requested by the Panel.

**Age Distribution of Water Mains**

2. The age distribution of the water mains in the water supply network is summarized in the following table:

Age (year)	>50	30-50	20-30	10-20	<10
Percentage	16	29	18	26	11

3. The Stage 1 Phase 1 works include about 350 km of water mains scattered through the whole territory in old and developed areas. These water mains have been identified to have contributed most significantly to the burst and leakage problems. The age distribution of the water mains covered by the Stage 1 Phase 1 works is tabulated below:

Age (year)	>50	30-50	20-30
Percentage	25	45 <sup>(1)</sup>	30 <sup>(2)</sup>

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Notes: (1) predominantly galvanised iron pipes

(2) predominantly salt water mains

## **Service Life of Water Mains**

4. There are different pipe materials being used in our water supply network. The service life of a water main will vary with the ground condition and the water it carries. For fresh water mains, the service life is around 50 years for mild steel and ductile iron pipes. Galvanised iron pipes were widely used in the 50's and 60's which have screw joints subject to external corrosion and hence a shorter service life of about 30 years. For salt water mains, because of the corrosive action of the salt water, the service life is comparatively shorter and in the case of pipe materials used in older days such as cast iron and asbestos cement, the service life could be as short as 20 years. With the advancement in technology, there are pipes of more durable materials and longer service life available in the market. New types of salt water mains under consideration at this stage include:

- (i) mild steel and ductile iron pipes with more robust and stringent specification for cement mortar/concrete protective lining; and
- (ii) corrosion resistant plastic pipes including polyethylene pipes (MDPE and HDPE) and molecular oriented polyvinyl-chloride pipes (MOPVC).

5. The selection of appropriate pipe materials for replacement forms an essential part of the replacement programme. It is one of the topics in the investigation studies which the consultants are required to address. With the use of new or stronger pipe material we expect the service life of salt water mains can be increased to 30 years or more.

### **Effect of Private Sector Participation (PSP)**

6. The consultancy study on PSP in the water supply services is under way at this stage. It will take some more time before the decision on the way forward can be made. Implementation of PSP, if this is to go ahead, could require another two to three years to take effect.

7. There is however an urgent need to commence the replacement/ rehabilitation programme as soon as possible in order to improve the condition of the water supply network, which has shown signs of rapid deterioration as evidenced by the number of pipe failures in 1998 (25,700 pipe failures and the loss of water due to such failures estimated to be 232 million cubic metres). We estimate that the above figures will correspondingly be increased to 40,000 pipe failures and 629 million cubic metres of loss of water per year in 20 years' time if no improvement work is to be carried out for the network. Deferring the replacement/rehabilitation programme by three years' time will aggravate the ageing problem of the supply network.

8. The part of the project which we propose to upgrade to Category A covers investigation studies for the works which a responsible operator of water supplies, be it public or private, will carry out in order to achieve an effective and timely maintenance plan for the underground assets.

### **Application of New Rehabilitation Technique to Phase 1A Works**

9. Phase 1A of the works to be undertaken by in-house staff is scheduled for earlier completion in 2005. The works are now under design stage and further sub-divided into two packages with construction start dates programmed for November 2000 and February 2002. The findings and recommendations on rehabilitation techniques by the consultants under Phase 1B are expected to be available before the end of the investigation studies i.e. before end of 2000. The recommendations will be incorporated into the Phase 1A works where applicable.