

## **NOTE FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **Supplementary information on 90WC – Replacement and rehabilitation of water mains, stage 1 phase 1**

#### **INTRODUCTION**

In considering the paper referenced PWSC(2003-04)4 on the above project on 9 April 2003, the Public Works Subcommittee requested the Administration to provide supplementary information on –

- (a) the various pipe materials to be used for water mains of different sizes under the proposed water main replacement works, with main characteristics of the materials and their respective unit costs; and
- (b) pipe materials used in recent waterworks projects of other countries.

#### **THE ADMINISTRATION'S RESPONSE**

##### ***Pipe materials to be used***

2. Based on the detailed design completed by the consultants under **177WC**<sup>1</sup> – “Replacement and rehabilitation of water mains, stage 1 phase 1B – detailed design and advance works”, the Director of Water Supplies will use the following pipe materials for the replacement works of the project –

**/Size.....**

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<sup>1</sup> In March 2001, Finance Committee approved the upgrading of part of **90WC** as **177WC** to Category A under Head 709 at an estimated cost of \$69.8 million in money-of-the-day prices.

<b>Size Range</b> [diameter in millimetres (mm)]	<b>Existing pipe materials</b>	<b>Pipe materials to be used for the replacement works</b>
700mm and above	Mild steel (with bituminous lining)	Mild steel (with cement mortar or epoxy lining)
400mm to 600 mm	Cast iron and asbestos cement	Ductile iron (with cement mortar lining)
300mm and below	Cast iron, asbestos cement, galvanised iron and unplasticised polyvinyl chloride (UPVC)	Polyethylene

### *Main Characteristics and Unit Cost*

3. The main characteristics and unit cost of the pipe materials stated in paragraph 2 above are as follows –

<b>Pipe Material</b>	<b>Main Characteristics</b>	<b>Unit Cost</b>	
		<b>Pipe Diameter (mm)</b>	<b>Unit Cost (\$/m)</b>
Mild steel	(a) Widely used throughout the world for large diameter pipes	1 200	\$2,100
	(b) Most commonly jointed by welding. Durability of these pipes depends on effectiveness of the external and internal protection to the pipes	800	\$1,200
	(c) Epoxy lining or cement mortar lining exhibits better corrosion resistance than bituminous lining		

/Pipe.....

Pipe Material	Main Characteristics	Unit Cost	
		Pipe Diameter (mm)	Unit Cost (\$/m)
Ductile iron	(a) Mostly used for medium size water mains	600	\$1,100
	(b) Push-in rubber ring joint is the most commonly used type of jointing	400	\$600
	(c) Well-protected against corrosion with a cement mortar lining		
Polyethylene	(a) Widely used nowadays for small diameter water mains. There is an increasing tendency for these pipes to be used for larger water mains	300	\$500
	(b) Butt-welded or electro-fusion joints are usually used for jointing	180	\$120
	(c) Exhibits good corrosion resistance		

#### *Pipe Materials Used in Other Countries*

4. The pipe materials stated above have proven to be durable and suitable and are widely used in Japan, United States, United Kingdom and other European countries for comparable projects. Mild steel, ductile iron and polyethylene pipes are predominantly used for large, medium and small diameter water mains respectively in these countries.

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