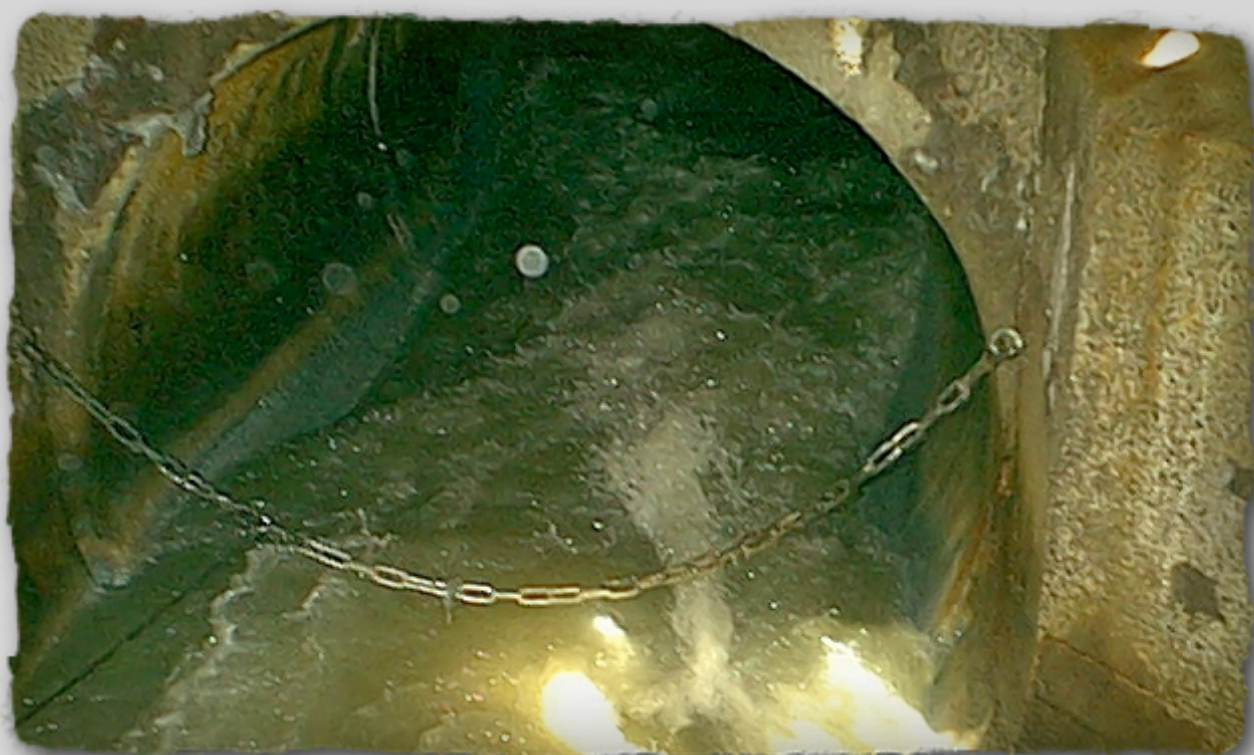


*Flow Survey*  
*using Flowmeter in Hong Kong*  
正確步驟你要知  
流量監測更簡易



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## Why is Flow Survey Needed?

The underground storm water and sewage systems of Hong Kong have been built in early years. Their efficiency and reliability have declined due to numerous defects accumulated as time passes. The built up potential risks can eventually lead to serious economic and even life loss if rehabilitation is not taken in time. In order to assess the performance and locate the defects of the current hydraulic system before rehabilitation, a flow survey is usually carried out. Appropriate remedial measures can then be determined to alleviate the problems. Besides, a long-term flow survey can also monitor water system to alarm flooding.

### 為何需要流量監測？

香港的污水和雨水排放系統多於早年建成，經年累月的損耗積累了大量缺陷，令系統的效率 and 可靠度大大降低。如果沒有及時的管道修復，長年累積的潛在風險最終可以導致嚴重的經濟損失和人命傷亡。在管道修復之前，往往需要先進行流量監測以評估排放系統目前的效能和找出缺陷的所在，以便之後採取適當的補救修復措施，處理系統的潛在問題。另外，長期的流量監測也可以監察水道，預警洪水。



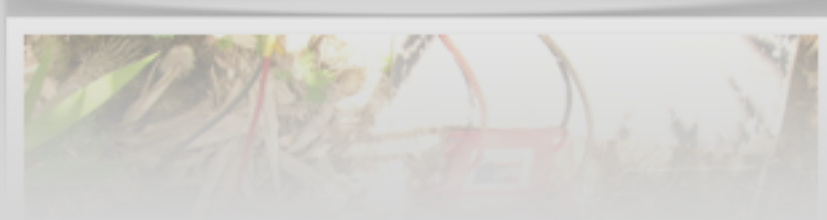


## Application of Flowmeters in Flow Survey

A flow survey usually involves the application of flowmeters. A flowmeter is a device for measuring the flow velocity and flow depth which are used to calculate the flow rate. One or more flowmeters are usually temporarily installed at site for data collection while handheld flowmeters are used for quality assurance checks during data retrieving each week after the flowmeters have been installed. The most common site flowmeter is ultrasonic flowmeters while turbine flowmeters are often used as handheld flowmeters.

### 流量計於流量監測中的應用

一個流量監測往往需要應用流量計。流量計用於測量流速和流體的深度以得出流量率。一個或多個流量計會短期安裝於監測地點收集數據，而手提式的流量計則用於每星期一次的數據質素保證測量。最常安裝於測量地點的流量計是超音波式流量計，而手提式的流量計多是渦輪式的。



## **Important Notes for Flow Survey**

The following points shall be noted for a flow survey:

1. The personnel carrying out the survey shall be well trained, with relevant experience and competent
2. The survey operators shall be equipped with personal protective equipment during the survey
3. Both employees and employer shall stick to the occupational health and safety regulations and obligations to ensure a safe working environment and reduce the influence on the public

### **流量監測需注意的要點**

當進行流量監測時，以下幾點需要注意：

1. 進行監測的人員應該有足夠的訓練，具備相關的經驗和為合資格人士
2. 進行監測的人員應使用個人保護裝備
3. 僱主和僱員都應遵相關的職業健康及安全條例，確保工作環境和個人的安全，並將對公眾的滋擾減至最低



## Pre-survey Preparations for flow survey

Before commencement of the survey, the following procedures shall be reasonably taken:

1. A detailed safety plan and risk assessment shall be done. Depending on site situation, TTA may be required.
2. The survey location shall be visited to choose appropriate specific site for flowmeter installation.
3. Washing the surveying conduit by pipe jetting if necessary.
4. The flowmeters shall undergo the pre-installation functional test and calibration.

### 流量監測的準備工作

在流量監測開始前，以下的措施應恰當地執行：

1. 須有一個詳細的工作安全計劃和進行風險評估。視乎情況，可能需要短期的特別交通安排(TTA)。
2. 測量的地點應事前考察以選擇最合宜的流量計安裝位置
3. 視乎情況，測量的水道可以高壓噴灑的方式清洗
4. 所有的流量計在安裝前應進行事前功能測試和校準，確保正常運作





## General Procedures for a Flow Survey

The following are the general steps for a flow survey:

1. Carry out equipment site functional testing & calibration
2. Measurement of the cross-sectional dimensions of the conduit
3. Equipment installation and commencement of the continuous recordings
4. Weekly site visits to retrieve recorded data, carry out quality assurance checks and check the operation of the instruments
5. Completion of the continuous recording period and deliver fully processed data and survey report to the client

### 流量監測的一般程序

以下是一般流量監測的程序：

1. 進行安裝地點的功能測試和校準
2. 量度测量的水道的橫切面以計算流體的流切面面積
3. 安裝監測的器具，開始一段時期的連續流量監測
4. 進行每週一次的數據收集，數據質素保證測量和確保器具正常運作的檢查
5. 完成實地監測和流量監測報告，把報告呈送客戶



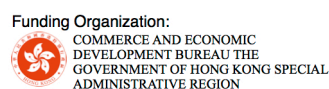
## Further Information

Up to the moment, there are no general standards for carrying out a flow survey in Hong Kong. However, the Utility Training Institute (UTI) is planning to publish guides and set a good practice for the field of flow survey. Readers may reach the website of Hong Kong Institute of Utility Specialists (HKIUS) <http://hkiaus.org.hk> for further information.

## 更多資訊

目前為止，香港並無任何統一的準則以進行流量監測，因此管綫學院正計劃出版相關的指引和為流量監測的工作建立規範。讀者可以到香港管綫專業學會的網站了解更多的資訊。

### ***Guide to Short-term Flow Surveys of Closed Conduits in Hong Kong***



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