

Utility Survey by Non-destructive Method - using Pipe Cable Locator

善用管綫探測儀 探測地下管綫易



Publisher:



Accreditation organizations:



Hong Kong Institute of Utility Specialists 香港管綫專業學會
Hong Kong Utility Research Centre 香港管綫管理研究中心

Funding Organization:



COMMERCE AND ECONOMIC
DEVELOPMENT BUREAU THE
GOVERNMENT OF HONG KONG
SPECIAL ADMINISTRATIVE REGION

Supporting organization:



Construction Professionals'
Development Centre
香港工程師學會發展中心

Why utility survey is needed?

The underground utility system in Hong Kong is extremely complicated. Construction, repair and maintenance works of the utilities often involve excavation. Careless excavation works may cause damage to underground utilities and thus accidents occur. Moreover, Government has set up laws requiring cable detection before digging the ground to avoid damage to the utilities.

為甚麼要測量管綫？

香港的地下管綫密度甚高，且非常複雜，當進行鋪設及維修工程時，可能需要開挖。然而，草率的開挖可能會損害地下管綫和導致意外。政府亦已立法監管，規定開挖前必須作管綫測量，避免任何事故或意外發生。



What is utility survey using pipe/cable locator?

Utility survey aims at locating the position of the pipe and measuring the depth of it. The pipe/cable locator employs electromagnetic method to detect the magnetic field of conductors underground. The alignment of the metallic pipes can then be traced by detecting the current of the cable/pipe. This allows the buried utilities to be located without excavation.

怎樣利用管綫探測儀作管綫測量？

管綫測量的目的是找出地下管綫的位置和深度。管綫探測儀利用電磁法來探測埋在地下的導體所發出的磁場。探測儀可透過探測金屬管綫的電流，追蹤其路由。利用此非破壞技術，無須大範圍開挖，便可獲取地下管綫的位置。



Steps and points to note

Before commencement of works, take all reasonable steps including:

1. Make sure that there is full range of survey equipment and they are in full working order.
2. The operator shall collect the record plans of the survey extent from the utility undertakers/ relevant Government Departments.
3. Surveying shall be performed by Competent Person.
4. Both employers and employees shall comply with relevant occupational health and safety legislations and obligations to ensure a safe working environment and minimize the disturbance to the public.

步驟及注意事項

進行工程前，須採取一切合理步驟，包括：

1. 確保檢測工具齊全且運作正常。
2. 操作員須由管綫承辦商/相關政府部門獲取工程法範圍的紀錄圖則。
3. 測量必須由合資格人士進行。
4. 僱員及僱主必須遵守相關的職業安全及健康條例，確保工作環境和個人的安全，並將對公眾的滋擾減至最低。






When commencing the detection, the following shall be noted:

1. Operator shall use Personal Protective Equipment during inspection.
2. Use different frequencies and techniques alternatively to get the best result.
3. Do not measure the depth at tees, bends, where depth changes, near other lines and near the transmitter.
4. At least 90% of the sample points on locatable services reach the accuracy of $\pm 165\text{mm}$ or $0.1d$ (depth) whichever is greater. The levels shall be related to the center for metallic pipes or cables, crown of ducts and inverts of sewers and drains.

施工時，應注意以下事項：

1. 操作員必須使用個人保護裝置。
2. 使用不同頻率和探測技巧互相驗證，以達至最準確效果。
3. 避免於電纜轉角處、分岔點、深度轉變處、另一電纜或發射器附近量度深度。
4. 最少九成探測點的準繩度應在 ± 165 毫米或 $0.1d$ （深度）之內（取較大值）。量度深度時，若為金屬喉／電纜，取喉中；若為綫槽，取槽頂；若為水渠，則取內底為定點。

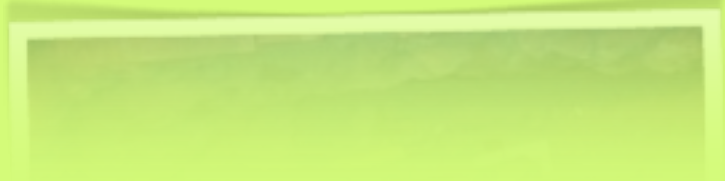
Type of lines 管綫種類	Depth measurement 測量深度
Metallic lines 金屬管綫	Center of pipes/ cable 喉中 
Non-metallic lines 非金屬管綫	Bottom of duct 喉底 
Cable ducts 電纜槽	Crown of ducts 喉頂 

After inspection, take the following actions:

1. Prepare detection report with summary of the utilities and drawing of survey result.
2. Quality control procedures shall be carried out properly to ensure the accuracy of the results.
3. Propose trial pit location if excavation is necessary to expose the line for final verification of its position and depth.

進行測量後，應採取以下行動：

1. 撰寫調查報告，報告中應附有測量結果及繪圖。
2. 報告須經過質量監控程序，以確定調查結果的準確性。
3. 若需要露出電纜以對測量結果作進一步驗證，則應對挖掘試孔的位置作出建議。

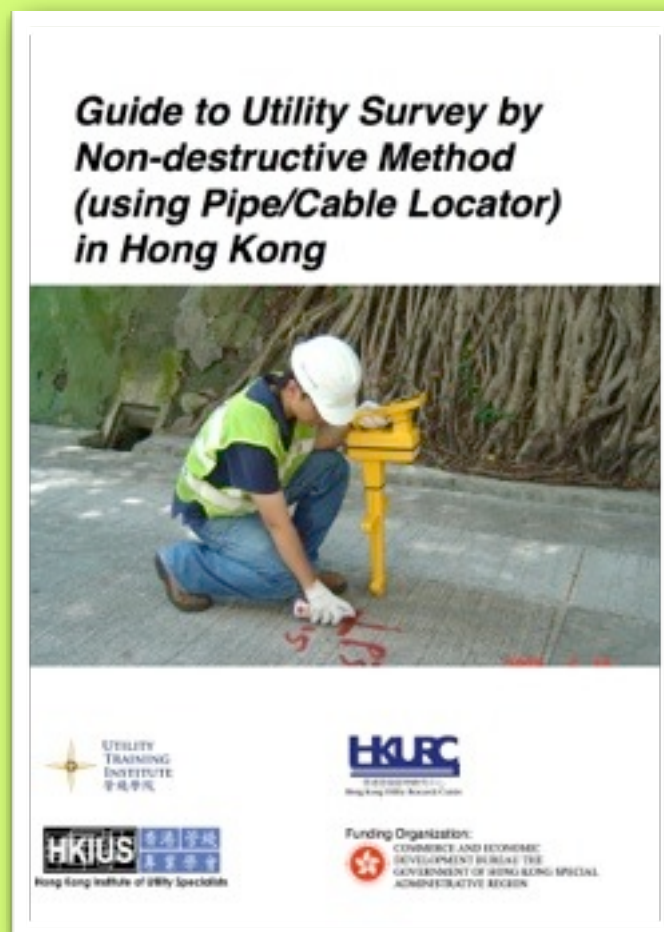


Further information

The Electrical and Mechanical Services Department has prepared Code of Practice on Working near Electricity Supply Lines (2005) and Avoiding Danger from Gas Pipes (1997) which states relevant regulations about excavation and location of underground utilities. The Code of Practice can be accessed via the EMSD website (<http://www.emsd.gov.hk>). The 'Specification for Utility Mapping By Non-Destructive Methods' (2009) proposed by the Hong Kong Institute of Utility Specialists provides requirements on scope and accuracies of the Survey in details. The specification can be accessed via the HKIUS website (<http://www.hkius.org.hk>).

更多資訊

機電工程署編製出版的《有關在供電電纜附近工作的實務守則》(2005)及《避免氣體喉管構成危險》(1997)訂定了開挖和測量管綫的相關守則。該等工作守則可透過機電工程署網頁(<http://www.emsd.gov.hk>)查閱。另由香港管綫專業學會編製的〈以非破壞技術作管綫測量標準〉，則詳述了測量的範圍及準繩度的要求。該標準可透過香港管綫專業學會網頁(<http://www.hkius.org.hk>)查閱。



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