GN-5/2022

Guidelines on Work near Underground Telecommunications Lines

Communications Authority

25 February 2022

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Foreword

F.1 This document entitled "Guidelines on Work near Underground Telecommunications Lines*"* ("the Guidelines") is issued by the Communications Authority ("CA") pursuant to section 6D of the Telecommunications Ordinance (Cap. 106) ("Ordinance") and Special Condition 16 of the Unified Carrier Licence ("UCL"). The purpose of the Guidelines is to provide practical guidance to the relevant parties including holders of UCL in respect of the requirements set out under section 18A of the Ordinance relating to carrying out work below ground level near an underground telecommunications line.

F.2 Under section 22A of the Ordinance, contravention of any requirement of section 18A amounts to an offence and the person in contravention is liable on conviction to a fine of up to $200,000 and imprisonment for up to 12 months.

F.3 Compliance with the Guidelines may be raised as a defence for a person charged under section 22A for contravention of section 18A.

F.4 Pursuant to section 22B of the Ordinance, a provision of the Guidelines that appears to the magistrate or the court to be relevant to an offence under section 22A is admissible in evidence in the proceedings.

F.5 An excerpt of the relevant provisions of the Ordinance is at **Appendix 1**.

A. Introduction

1. In Hong Kong, underground spaces, especially those in urban areas, are packed with various utility facilities such as electricity supply lines, gas pipes, sewage and drainage pipes, as well as telecommunications ducts and lines including copper wires and optical fibre cables, etc. that provide important means of telecommunications to the general public and business entities.

2. Telecommunications networks and services underpin the operation of an information society. As an enormous amount of telephone calls and internet traffic is carried over a single optical fibre/copper cable for public fixed and mobile telecommunications services, the potential disruption to the general public and business sectors caused by damage to underground telecommunications facilities could be very serious. With the ever-increasing demand for data access by users including both individuals and business entities, as well as more extensive use of smart city applications, the integrity of Hong Kong's telecommunications infrastructure (including underground telecommunications facilities) is crucial. Any damage to underground telecommunications lines would not only result in interruption of telecommunications services, but might also cause disruption to the important commercial activities and/or ordinary day-to-day activities of the society in Hong Kong carried out through emails, voice service, data service, on-line transactions, internet access etc.

3. The Guidelines sets out the necessary precautionary steps and measures that the relevant parties shall comply with before and when they carry out any work near underground telecommunications lines, so as to reduce the risk of damage to these lines resulting in interruption of telecommunications services carried along the underground telecommunications lines.

4. In the course of preparing the Guidelines, the CA has consulted the relevant sectors and stakeholders. Views and advices received have been considered and incorporated into the Guidelines where appropriate.

B. Scope

5. The Guidelines applies to any work below ground level carried out/to be carried out near an underground telecommunications line. It provides practical precautionary steps and measures for relevant parties to follow so as to prevent any damage to the telecommunications lines within or near the work site, or any interruption to a telecommunications service, arising from the work.

6. The Guidelines is applicable to all persons who carry out, or cause or permit another to carry out, any work below ground level near an underground telecommunications line including without limitations utilities companies, contractors, competent persons and those who are involved in planning, designing, organising, supervising or carrying out the work near underground telecommunications lines/facilities. Any person who carries out, or causes or permits another to carry out any work below ground level at a work site within or near an underground telecommunications line in ways other than that provided in the Guidelines must ensure that the requirements under section 18A of the Ordinance are fulfilled and shall demonstrate that the protection for the telecommunications lines offered by their proposed precautionary steps or measures is not inferior to that set out in the Guidelines.

7. For the avoidance of doubt, where a matter is expressed or construed as an obligation of a fixed network operator ("FNO") (as defined in paragraph 8 below) under the Guidelines and if the relevant FNO has failed to perform or discharge that obligation, such failure may be taken into account by the Office of the Communications Authority ("OFCA") as a relevant factor in any investigation against the relevant working party (as defined in paragraph 8 below) in relation to an offence under section 18A of the Ordinance.

C. Definitions

8. The Guidelines adopts the following definitions –

"competent person" refers to a natural person who has attended and passed a course as recognized by OFCA on detection of underground telecommunications lines and is registered under OFCA. See details at **Appendix 2** for the competent person approval requirements and procedures;

"fixed network operators" or "FNOs" means holders of UCL issued by the CA for the provision of wireline-based fixed telecommunications services;

"telecommunications line" means, according to section 2 of the Ordinance, any wire, cable, duct, optical fibre, filament, line, pipe, pole, post, tube, conduit, support structure, ancillary equipment or apparatus or other physical medium used or intended for use as a continuous artificial guide for or in connection with telecommunications;

"trial hole" means an excavation for exposing part of the target underground telecommunications lines, carried out under the supervision of a competent person at the site of work by site personnel using hand tools for digging, with the exception that hand-held power tools can be used to break the concrete paved surface with extreme care;

"underground telecommunications line" means, according to section 2 of the Ordinance, a telecommunications line located below ground level in any land that is not seabed;

"working party" means any authorised person, including contractor, site contractor and site personnel concerned involved in planning, designing, organising, supervising or carrying out work near an underground telecommunications line; and

"work near an underground telecommunications line" refers to the types of work listed in Table 1 below (excluding any precautionary steps or measures described in this document) which are conducted at a work site where the separation between the work site boundary and the underground telecommunications line is within the distance specified.

Table 1 – Work near an underground telecommunications line

Type of proposed underground work	**Separation Distance[1]**
Trench or other excavation work in stable ground conditions up to 1.5 metres in depth	3 metres
Trench or other excavation work in stable ground conditions over 1.5 metres and up to 5 metres in depth	5 metres
Trench or other excavation work in stable ground conditions over 5 metres in depth	10 metres
Vertical, horizontal or inclined penetration including sheet piling, ground investigation and any kind of drilling or core sampling or ramming – either by hand tools, hand-held power tools[2] or machines	3 metres
Welding or other hot work near exposed segments of an underground telecommunications line	10 metres
Piling, percussion moling or pipe jacking	15 metres
Any form of tunnelling, boring, driving headings, cable/pipe jacking	Always consult FNOs beforehand
Use of explosives	60 metres

[1] The measurement is taken from the centre line of the underground telecommunications line to determine whether work will be considered near an underground telecommunications line.

[2] Hand-held power tools refer to hand-held mechanized tools designed for operation that utilize electrical or pneumatic power.

D. Coverage of Underground Telecommunications Lines in Hong Kong

9. Underground telecommunications lines are widely installed throughout the territory of Hong Kong including Hong Kong Island, Kowloon, the New Territories and outlying islands, serving both residential and business users. FNOs have to obtain relevant licences and/or permits from the relevant Government departments or authorities before they place and maintain any underground telecommunications line on public streets or unleased Government land.

10. In order to protect their underground telecommunications facilities, FNOs usually install optical fibre cables and copper wires inside unplasticised polyvinyl chloride ("uPVC") ducts.

E. Obligation of Fixed Network Operators

11. FNOs must –

(a) maintain and update records on as-built alignments of their telecommunications lines, and ensure the accuracy of such records as long as the telecommunications lines remain underground;

(b) provide the working party, upon request, with the most up-to-date drawings/plans of their underground telecommunications lines within the agreed or reasonable time frame;

(c) provide reasonable and sufficient protection for their underground telecommunications lines such as laying optical fibre cables and copper cables in uPVC ducts; and

(d) upon commencement of section 18A of the Ordinance, install tracer wire[3] or equivalent[4] that is properly grounded to enable detection of their installed telecommunications lines, for a new underground telecommunications line (including cable duct), and as far as practicable whenever (i) a new telecommunications cable is added to an existing cable duct; or (ii) any maintenance or excavation work is performed to repair, remove, replace or relocate an existing underground telecommunications line or cable, or any combination thereof.

12. FNOs must cooperate closely with any working party who carries out work near their underground telecommunications lines in a legitimate manner. The FNOs with underground telecommunications lines in the vicinity of the work ("relevant FNOs") should timely provide information and advice on their underground telecommunications lines to the working party and arrange site meetings with the latter as necessary. In case the underground telecommunications lines concerned are critical to their business operations, the relevant FNOs should consider adopting additional precautionary measures such as arrangement of site patrol with

[3] Please refer to **Appendix 3** Tracer Wire Reference for details.

[4] If underground telecommunications lines are made with a metallic conductor or wire (such as armoured cables) to propagate the signal for detection, they may be regarded as equivalent to a tracer wire.

the working party to monitor their underground telecommunications lines so as to prevent them from being susceptible to damage.

13. A list of FNOs who are authorised to install underground telecommunications lines in Hong Kong ("authorised FNOs") can be found on OFCA's website.[5] Any request for the contact information of an FNO can be made to the contact point of OFCA as specified in Section H of this document.

[5] The information is available at https://www.ofca.gov.hk

F. Precautionary Steps to Follow Before Work Begins

14. The working party shall take all reasonable steps to ascertain whether an underground telecommunications line exists within or near the proposed work site. The purpose of adopting the precautionary steps as detailed in paragraphs 16 to 45 below is to minimise the risk of damage to the existing underground telecommunications lines in the area. The approach is based on obtaining relevant and necessary information from the relevant FNOs of the underground telecommunications lines in the area of concern before the work begins, and making use of such information to assist the detection of the telecommunications lines already established. With such information available, the working party should be able to ascertain, before the work begins, whether any underground telecommunications line exists within or near the proposed work site and, if so, the alignment and depth of the line in the area of concern, and to take necessary precautionary measures with an aim to reducing the risk of damage to the existing underground telecommunications lines in the course of carrying out the work in the area.

15. Before the work begins, the working party shall ensure that all relevant personnel take all the following steps to ascertain whether any underground telecommunications line exists within or near the proposed work site; and if so, the alignment and depth of the line –

Step 1 – collect telecommunications lines layout plans;

Step 2 – locate underground telecommunications lines;

Step 3 – ascertain alignment and depth; and

Step 4 – prepare detection report by a competent person.

(1) Collect telecommunications lines layout plans

16. The working party shall approach **all** authorised FNOs to obtain the necessary information, in particular the telecommunications lines layout plans before any work begins.

17. An early approach to the relevant FNOs to obtain the telecommunications lines layout plans is recommended to the working party for a major project involving large scale of construction, horizontal

drilling or tunnelling. Consideration should be given by the working party at the design stage, or even as early as the feasibility study phase, to planning work away from an area where there is likely to have underground telecommunications lines. If the proposed work must be carried out and requires a major diversion of underground telecommunications lines to avoid damage to the latter, the relevant FNOs may require a long lead time to plan and complete the diversion.

18. When making a request for information to the FNOs, the working party shall include a full description of the scope and, where appropriate, the nature of the proposed work in order for the relevant FNOs to identify the area in which they consider their underground telecommunications lines may be affected and provide all available records of their relevant underground telecommunications lines that are within or near the work site.

19. Upon receipt of a written notice (by facsimile, email, post or otherwise) of the proposed work from a working party, and in situation where a relevant FNO considers that its underground telecommunications lines will likely **not** be affected by the proposed work, the FNO shall inform the working party in writing about its view within **seven (7) working days** from the date of receipt of notice.

20. Whereas upon receipt of a written notice of proposed work from a working party, a relevant FNO considers that its underground telecommunications lines will likely be affected by the proposed work, the FNO shall, at its own cost, provide the working party with the layout plans of the relevant underground telecommunications lines within **14 working days** from the date of receipt of notice, or such other period as mutually agreed between the parties concerned. If there is no response from the FNO within the periods specified above (i.e. within seven (7) working days if underground telecommunications lines will likely not be affected by the proposed work, and within (14) working days if underground telecommunications lines will likely be affected), it is reasonable for the working party to presume that the underground telecommunications lines of the FNO will likely **not** be affected by the proposed work.

21. An FNO receiving a notice mentioned in paragraph 19 or 20 above shall immediately date-stamp the notice upon receipt, and shall retain the stamped notice for a minimum period of five years. The working party may request, in the notice, an acknowledgement of its receipt, stating the date upon which it was received.

22. The working party shall consult or request updated telecommunications lines layout plans from the relevant FNOs **14 working days before the work begins**, if the plans in hand have been provided by the relevant FNOs for more than three months. After the work began, if the working party has overall control of the work site until completion of the work, the requisition of updated telecommunications lines layout plans is not necessary unless the working party has given access to the relevant FNOs for laying new telecommunications lines in the area of concern.

23. The telecommunications lines layout plans provided by a relevant FNO shall be of suitable scale and sufficient details for the working party to find out, as far as possible, (a) the number of telecommunications lines including abandoned lines; (b) their alignment and depth, with dimensions making reference to appropriate reference points; (c) colour of the uPVC ducts (if applicable) in which the telecommunications cables are laid; and (d) whether the telecommunications lines are detectable or not (i.e. with or without tracer wire or equivalent). The plans shall also provide a good indication of the presence, alignment and depth of underground telecommunications lines at a particular site that will help subsequent telecommunications lines detection. Notwithstanding that, **the working party shall not solely rely on the information given in the telecommunications lines layout plans provided by the relevant FNO** to prevent any damage to the lines concerned as the plans might contain discrepancies due to –

(a) the position of reference points (e.g. the kerb or building line) which may have been moved since the layout plans were drawn;

(b) regrading or resurfacing of the road rendering the depth shown not up-to-date;

(c) relocation of underground telecommunications lines without the authorisation or knowledge of the FNO; or

(d) the environment in the circumstances e.g. underground telecommunications lines, marked as straight lines in the layout plans, may not in practice run in a straight alignment, or the alignment and depth of underground telecommunications lines may vary abruptly over a short distance to avoid underground obstructions.

(2) Locate underground telecommunications lines

24. If the telecommunications lines layout plans supplied by any of the relevant FNOs indicate that an underground telecommunications line exists or is likely to exist within or near the proposed work site within the separation distance specified in Table 1 above, the working party shall **appoint a competent person** to carry out the detection work for the telecommunications line.

25. Before conducting the detection of the telecommunications line, the competent person shall be provided with copies of (a) telecommunications lines layout plans from the relevant FNOs; and (b) work site drawings from the working party.

26. The competent person shall use suitable underground cable detection devices[6] to locate as accurately as possible any underground telecommunications lines within or near the work site before the work begins. The telecommunications line detection device to be used by the competent person shall be non-intrusive and calibrated as per the manufacturer's requirements.

27. The competent person shall **provide relevant advice and propose locations including trial hole locations** for carrying out the detection work in Step 3 according to the findings in paragraph 26 above or, in case an alignment cannot be reasonably located, by referring to the relevant FNOs' telecommunications lines layout plans. The proposed trial hole locations shall be separated by an appropriate distance which enables the working party to ascertain, as far as practicable, the alignment and depth of the relevant underground telecommunications lines through exposing relevant segment(s) of such buried lines by the use of hand tools as described in paragraph 51 below.

28. The competent person shall properly place **markings** for the proposed trial hole locations and their vicinity in case they are to be dug to ascertain the alignment and depth of the existing underground telecommunications lines. All markings shall be done with waterproof crayon, paint or self-adhesive temporary road marking tapes on paved surfaces, or with wooden pegs in grass or unpaved areas.

[6] Such devices might use different detection methods, such as radio frequency, signal generation and metallic detection.

29. The competent person shall record in writing all of his/her findings by completing Section D of the "Underground Telecommunications Line Detection Report" (see **Appendix 4** for a sample report) and **brief the working party** on the content of the completed Section D thereof, with particular reference to the locations of the proposed trial holes for digging and the segments of target underground telecommunications lines to be exposed for the purpose of ascertaining their alignment and depth.

30. The competent person shall be personally on site for direct supervision of the detection work for underground telecommunications lines and marking of the proposed trial hole locations and underground telecommunications line alignment, if any, within or near the work site and submit the "Underground Telecommunications Line Detection Report" to the working party appointing him/her.

(3) Ascertain alignment and depth

31. Following Step 2 as described above, the competent person shall use toroidal active detection (or another detection method which is not inferior to that) to ascertain the alignment and depth of underground telecommunications lines. If the competent person considers it practicable to perform toroidal active detection by using the telecommunications lines at the manholes/junction boxes[7] of the relevant FNOs, he/she shall seek consent from the FNOs concerned to obtain their permission to access to the manholes/junction boxes in the area of concern within or near the work site.

32. On the other hand, in situation that the competent person considers that trial holes shall be dug for the purpose of ascertaining the alignment and depth of the underground telecommunications lines in the area of concern within or near the work site, the working party shall arrange digging of trial holes at locations as advised by the competent person in Step 2.

[7] Only certified workers holding the relevant certification that meets the requirements for entry into confined spaces can be permitted to enter a confined space. The FNO will be responsible for escorting the working party and providing necessary assistance during the detection work.

33. The competent person shall be personally on site for supervision of the digging of the trial holes until the relevant segment(s) of the target telecommunications line is exposed or the digging of trial hole is completed. Throughout the process, the competent person shall ensure the use of proper devices, tools and methods for detecting and exposing relevant segments of the underground telecommunications line, and frequently update the working personnel as to the most accurate location.

34. Trial holes shall only be dug by hand tools with the exception that hand-held power tools can be used to break the concrete paved surface with extreme care. Since improper use of hand tools may damage the underground telecommunications lines, reference shall be made to paragraph 51 below for the method of proper use of hand tools. Both horizontal and vertical separations between the exposed segments of the underground telecommunications lines and each of the reference points, as identified by the competent person, shall be recorded properly.

35. Following paragraph 32 above, trial hole shall be dug **within the work site** when –

(a) the alignment of an underground telecommunications line is located within the work site;

(b) the alignment of an underground telecommunications line is located within an area 500 millimetres outside the boundary of the work site;

(c) the alignment of a group of underground telecommunications lines and other lines is located within an area three (3) metres outside the boundary of the work site; or

(d) the alignment is not reasonably located (see paragraph 27 above).

The competent person shall advise opening a number of trial holes along the boundary of the work site opposite to the underground telecommunications line (in the case of (b) or (c)), or by referring to the relevant FNOs' telecommunications lines layout plans (in the case of (d)).

36. In respect of toroidal active detection, the working party / competent person should make arrangement for the target

telecommunications line inside a manhole/junction box or trial hole to be adequately accessible or exposed so as to permit the competent person to place a signal clamp around it for injection of a known high frequency signal into the telecommunications line by electromagnetic induction through the signal clamp. The competent person may use a receiver tuned to that frequency to check and ascertain, at an appropriate spacing (e.g. one (1) metre to three (3) metres) starting from the signal clamp location, the alignment and depth of the unexposed part of the target underground telecommunications line.

37. If the competent person finds it not practicable or meaningful to perform toroidal active detection or any other active detection methods, he/she shall advise and supervise the working party to dig additional trial holes, at a reasonable spacing mutually agreed between the competent person and the relevant FNOs, until the alignment and depth of all underground telecommunications lines are ascertained within the work site.

38. Should there be any discrepancies between the telecommunications line detection results and the relevant FNOs' telecommunications lines layout plans, the competent person shall conduct the telecommunications lines detection again and/or seek clarification from the relevant FNOs with a view to resolving the discrepancies.

39. The competent person shall **place markings for the alignment and depth of all underground telecommunications lines** with waterproof crayon, paint or self-adhesive temporary road marking tapes on paved surfaces or with wooden pegs in grass or unpaved areas. Steel pins, spikes or long legs, which could damage an underground telecommunications line must not be used. Any section of the underground telecommunications line with a sudden reduction of buried depth shall be clearly marked along the alignment.

(4) Prepare detection report by competent person

40. Upon completion of Step 3, the competent person shall record in writing all of his/her findings by completing Section E of the "Underground Telecommunications Line Detection Report" (see **Appendix 4** for a sample report). The full report which comprises Sections A to G shall include but not limited to the following information –

(a) name and registration number of the competent person;

(b) name of the working party who employs the competent person to carry out such detection work in Steps 2 and 3 ("detection work");

(c) location, date and time for which the detection work was carried out;

(d) brand name, model number, serial number, calibration record and the frequency used by the underground telecommunications line detection device used for the detection work;

(e) the telecommunications line layout plan detailing the alignment for each underground telecommunications line based on common reference points (e.g. lamp post, traffic light post or hydrant, etc.);

(f) depth profile of each underground telecommunications line (i.e. depth of line below ground level corresponding to each measurement point along the telecommunications line alignment);

(g) photographs showing the detection work in Steps 2 and 3 including those markings for telecommunications line alignment, depth and trial hole locations, if any;

(h) the relevant FNO's advice, in particular advice sought from the relevant FNO upon identification of major discrepancies between on-site telecommunications lines alignment and its telecommunications lines layout plans, if any;

(i) relevant site briefing records; and

(j) any other information which the competent person considers necessary.

41. The working party (e.g. the main contractor, sub-contractor, site contractor etc.) shall provide the site personnel concerned with a copy

of the "Underground Telecommunications Line Detection Report". The working party shall ensure that all relevant personnel (such as the operators of excavator/machine and workers engaged in the excavation works) are fully informed and aware of the locations, alignment and depth of the underground telecommunications lines as specified in the "Underground Telecommunications Line Detection Report" and other useful information such as the markings at the work site, the potential impact to the community as a result of damage to telecommunications lines and the appropriate precautionary measures so that they can exercise due care when working near the identified underground telecommunications lines. In this regard, the working party shall arrange a site briefing, preferably conducted by the competent person, for all the relevant personnel. The working party shall maintain records of the site briefing (including the date and time, venue, person conducting the briefing, contents of the briefing, and the names of the personnel attending the briefing).

42. The working party shall keep a copy of the "Underground Telecommunications Line Detection Report" on site and **make available the relevant documents for inspection, upon request by OFCA's representative** until completion of the work without causing any damages to telecommunications lines. The "Underground Telecommunications Line Detection Report" may be posted on the barrier or railing on the work site.

43. The working party shall ensure that the markings (both alignment and depth) made by the competent person are available on site before the work begins. To avoid confusion to drivers, markings in carriageways shall only be laid after the area is fenced off from traffic. Such markings shall be completely removed before the area is re-opened to traffic.

44. After the removal of road surface or pavement cover, if further work is required at the area concerned, the working party shall re-paint/retain telecommunications line markings in accordance with the "Underground Telecommunications Line Detection Report", so as to alert the site personnel, such as the operators of excavator/machine and workers engaged in excavation works, on the alignment and depth of underground telecommunications lines.

45. After completion of the work, the working party shall erase any residual markings it made on paved surfaces and shall not deface any original road marking.

G. Precautionary Measures for Working near Underground Telecommunications Lines

46. The working party shall ensure that, before any work near an underground telecommunications line begins, the relevant FNOs have been informed of the intended work. The working party shall also provide a method statement detailing the working method, plants employed and any measures that the relevant FNOs shall take before the work begins.

47. All site personnel, such as the operators of excavator/machine and workers engaged in the work, shall closely refer to the information provided in the "Underground Telecommunications Line Detection Report" in the course of excavation, and shall be vigilant for any markings placed to indicate alignment and depth of underground telecommunications lines.

(1) Horizontal clearance from underground telecommunications lines

48. As the position of excavation carried out by mechanical excavators and hand-held powered tools ("excavation equipment") may not be capable of being precisely controlled in practice, adequate minimum working distance shall be maintained between an underground telecommunications line and the point where the excavation equipment is applied so as to prevent any possible damages to the underground telecommunications line. **A horizontal clearance of at least 0.5 metre shall be maintained between the underground telecommunications line and the point where excavation equipment is operated**. The heavier duty of the excavation equipment is to be used, the greater the horizontal clearance between the underground telecommunications line and the point where the excavation equipment is operated shall be maintained (e.g. horizontal clearance shall be at least one (1) metre where mechanical excavators or other machines are used). If the horizontal clearance cannot be maintained, a very high level of caution must be taken and only hand tools shall be used.

49. Before any excavation work begins, the working party shall consult the relevant FNOs, coordinate with them if necessary and keep records if it is found that there is insufficient clearance from the underground telecommunications line as specified in paragraph 48 above.

50. Where explosives will be used at the work site, or that machines for piling, vertical boring etc. will be used, an even greater horizontal clearance shall be adopted to prevent any damages to an underground telecommunications line within or near the work site. The working party shall, in consultation with the relevant FNOs, determine the necessary horizontal clearance distance from the underground telecommunications line before the work begins.

(2) Use of hand tools and mechanical excavators

51. While hand tools are commonly used for exposing segments of an underground telecommunications line, due care shall be taken to prevent any damage to the line. Every effort shall be made to **excavate alongside an underground telecommunications line** rather than direct above it. Horizontal digging shall be used for final exposure of segments of an underground telecommunications line as the force applied to hand tools can be controlled more effectively. In particular –

(a) spades and shovels (with curved edges as far as possible) shall be used instead of other tools. They shall not be thrown or spiked into the ground but eased in with gentle foot pressure;

(b) picks, pins or forks shall be used with care to free lumps of stone etc. and to break up hard layers of sandstone; and

(c) picks shall not be used in soft clay or other soft soils near an underground telecommunications line.

52. The risk of causing damage to an underground telecommunications line by mechanical excavators and penetration machines (such as sheet piling machine, geotechnical investigation drilling machine) is much greater than that caused by hand tools. As such, apart from securing a greater horizontal clearance from the underground telecommunications line, the working party shall notify the relevant FNOs about the use of mechanical excavators before the work begins.

53. If the working party encounters difficulty in ascertaining the alignment or depth of the underground telecommunications lines within or near the work site, it shall seek assistance from the relevant FNOs before proceeding further with the work. Before commencing trial hole digging, the working party shall inform the relevant FNOs about the

nature of the intended work if it involves trenchless excavation or horizontal drilling such as tunnelling, percussion moling, pipe jacking and soil nailing, etc. If the work involved is far below ground level or sufficient clearance is provided and where it is confirmed by the relevant FNOs that the underground telecommunications line would not be affected or does not exist, the digging of a trial hole may not be required. Both the relevant FNOs and the working party shall ensure that any agreement between them in this regard shall be properly recorded for inspection upon request by OFCA's representative.

(3) Protection to underground telecommunications lines during work

54. Underground telecommunications line uncovered in an excavation shall be suitably supported and protected by the working party. The working party shall consult the relevant FNOs in advance wherever an excavation may cause an underground telecommunications line overhanging or having its position altered within the work site. The working party shall use proper methods to cover the exposed segments of the underground telecommunications line, and shall not alter the alignment or depth of any underground telecommunications line without the consent of the relevant FNOs. Where alteration of such a line is inevitable, the working party shall consult the relevant FNOs in advance and obtain their consent.

55. The working party shall provide sufficient protection to the underground telecommunications line to prevent any damages to it throughout the process of the work.

56. The working party shall ensure that all backfilling of excavations be done carefully and all protection materials (e.g. warning tapes, tiles, protection plates) be reinstated in their original positions. Suitable filling materials shall be used, any fill containing items likely to damage the underground telecommunications line (such as large pieces of rock and hard material) shall not be used. If in doubt, the working party shall consult the relevant FNOs in advance.

57. If the working party finds that the existing protection materials and/or filling materials of the underground telecommunications line are damaged or missing, it shall contact the relevant FNOs as soon as possible to make up such materials before the backfilling.

58. If the working party finds that the alignment or depth of the underground telecommunications line is different from the information given in the telecommunications lines layout plans, it shall inform the relevant FNOs before the backfilling.

59. In situation where trenchless methods (e.g. percussion moling, pipe jacking and auger boring) are used for laying and/or renovating underground cables and pipelines, the working party must take extreme care to prevent any damages to an existing underground telecommunications line given that the use of such methods may displace the soil around the line. The working party shall, in consultation with the relevant FNOs, work out and adopt necessary precautionary measures to protect the underground telecommunications lines before the work begins.

60. If welding or other hot works are to be carried out within ten (10) metres of the exposed segments of an underground telecommunications line, the working party shall take necessary precautions to prevent any damage to the protective coatings or sheaths of the exposed segments of the telecommunications line by heat, sparks or naked flames. If the welding or hot works are in the close proximity of the exposed segments of the underground telecommunications line, the working party shall consult the relevant FNOs on any special precautionary measures required before the work takes place.

61. Where explosives are to be used within 60 metres of an underground telecommunications line, or where piling, vertical boring for building structure, etc. are to be carried out within 15 metres of an underground telecommunications line, the working party shall agree with the relevant FNOs on any special precautionary measures required before the work takes place.

(4) Reporting damage to underground telecommunications lines

62. If the working party finds during the excavation or any work that the underground telecommunications line or its associated uPVC duct or tracer wire within or near the work site is damaged, however slight the damage might be, it shall inform the relevant FNOs immediately –

a) the working party shall stop the work near the underground telecommunications line and report to the relevant FNOs;

b) the working party shall take photos of the damage found, record the relevant findings in Part G of the detection report, and sign the record accordingly;

c) the relevant FNOs shall record the damage report from the working party when it is received;

d) the relevant FNOs shall take photos of the damage and document the findings upon arrival at the work site; and

e) the working party and FNOs shall keep the relevant records properly, and make available the relevant documents for inspection, upon request by OFCA's representative.

(5) Adequate site supervision

63. In the course of carrying out any work (including any temporary ones) in the work site, the working party shall exercise adequate and regular site supervision to ensure that the precautionary measures as required in the Guidelines are implemented where appropriate. In case there is difficulty in complying with any of the requirements stated in the Guidelines, irrespective of whether it is due to site conditions or otherwise, the working party shall consult the relevant FNOs and work out a mutually agreed solution before proceeding with the work near an underground telecommunications line. Both the relevant FNOs and the working party shall ensure that any agreement between them in this regard shall be properly recorded for inspection upon request by OFCA's representative. In addition, the working party shall ensure that access to the work area is strictly confined to authorised personnel only.

(6) Emergency situation

64. In case of an emergency work [8] near underground telecommunications lines, the working party shall contact the relevant

[8] Emergency work refer to the work for which the working party holds an Emergency Excavation Permit issued by the Highways Department, or emergency repair work required to restore essential services to the public (such as water, electricity, gas, telecommunications, etc.).

FNOs as soon as practicable. The relevant FNOs shall provide immediate advice as far as practicable by telephone, facsimile, or other electronic means. In addition, if the relevant FNOs consider that the underground telecommunications lines concerned are critical to their services, emergency personnel shall be urgently despatched to the site. The relevant FNOs shall provide layout plans and advice on precautionary and safety measures to the working party at the site.

65. The excavation shall be under the direct supervision of a competent person, who shall perform the detection of underground telecommunications lines if such lines are detectable, or in accordance with the layout plans provided by the FNOs or manholes locations, providing the underground telecommunications lines alignment and depth information to the site personnel until the excavation is completed. The relevant FNOs shall offer all necessary assistance to the working party.

H. Enquiries

66. Any enquiries on this document should be made to–

Office of the Communications Authority
29/F, Wu Chung House
213 Queen's Road East
Wan Chai, Hong Kong

(Attention: Telecommunications Engineer (M12)2)

Telephone No.: 2961 6420
Email address : cable-protection@ofca.gov.hk

Appendix 1 Legislation

An excerpt of the new provisions in the Telecommunications Ordinance (Cap. 106) relevant to the protection of underground telecommunications lines

2. Interpretation

(1) In this Ordinance, unless the context otherwise requires –

……

operative guideline (有效指引), in relation to an act or omission, means a guideline issued by the Authority under section 6D that is in force at the time of the act or omission;

underground telecommunications line (地下電訊線路) means a telecommunications line located below ground level in any land that is not seabed;

……

……

18A. Requirements relating to work near underground telecommunications lines

(1) A person must not carry out, or cause or permit another to carry out, any work below ground level near an underground telecommunications line, unless the person takes, before the work begins, all reasonable steps to ascertain—

(a) whether any underground telecommunications line exists within or near the proposed work site; and

(b) if so—the alignment and depth of the line.

(2) If a person carries out, or causes or permits another to carry out, any work below ground level at a work site within which, or near which, an underground telecommunications line exists, the person must ensure that all reasonable measures are taken to prevent—

(a) any damage to the line; or

(b) any interruption to a telecommunications service,

arising from the work.

……

22A. Contravention of section 18A an offence

(1) A person who contravenes section 18A(1) commits an offence and is liable on conviction to a fine at level 4 and to imprisonment for 6 months.

(2) A person who contravenes section 18A(2) commits an offence and is liable on conviction—

(a) if the contravention results in an interruption to a telecommunications service—to a fine of $200,000 and to imprisonment for 12 months; or

(b) in any other case—to a fine at level 4 and to imprisonment for 6 months,

and, in the case of a continuing offence, to a further fine of $10,000 for every day during which the offence continues.

(3) In proceedings against a person for an offence under subsection (1), it is for the person to show that the person took, before the work began, all reasonable steps to ascertain—

(a) whether any underground telecommunications line existed at the time within or near the proposed work site; and

(b) if so—the alignment and depth of the line.

(4) For the purposes of subsection (3), if the person shows that the person complied with an operative guideline relating to taking reasonable steps as referred to in section 18A(1), the person is taken to have shown that the person took all reasonable steps.

(5) In proceedings against a person for an offence under subsection (2), it is a defence for the person to show that the person complied with an operative guideline relating to taking reasonable measures as referred to in section 18A(2).

(6) Also, it is a defence for the person charged with an offence under subsection (2) to show that—

(a) the person took, before the work began, all reasonable steps for the purposes of section 18A(1); and

(b) any failure to take all reasonable measures for the purposes of section 18A(2) was due to reliance on

information provided by the licensee authorized to place and maintain the underground telecommunications line concerned.

22B. Use of guidelines in criminal proceedings under section 22A

(1) This section applies in relation to criminal proceedings before a magistrate or a court in which a person is alleged to have committed an offence under section 22A(1) or (2).

(2) A provision of an operative guideline that appears to the magistrate or the court to be relevant to the alleged offence is admissible in evidence in the proceedings.

(3) Also, if—

(a) a provision of the operative guideline appears to the magistrate or the court to be relevant to a matter that the prosecution must prove in order to establish the offence; and

(b) the prosecution has proved that the person failed to comply with the provision at the relevant time,

the prosecution may rely on the failure as tending to prove the matter.

(4) However, subsection (3) does not apply if the person shows that, for the matter referred to in subsection (3)(a), a requirement alleged to have been contravened was complied with other than by complying with the provision of the operative guideline.

.....

32CA. Burden of proof

A person is taken to have shown a matter that needs to be shown under section 22A(3), (4), (5) or (6) or 22B(4) if—

(a) there is sufficient evidence to raise an issue with respect to the matter; and

(b) the contrary is not proved by the prosecution beyond reasonable doubt.

.....

Appendix 2 Competent Person Approval Requirements and Procedures

Background

2.1 Section 18A of the Ordinance and the Guidelines prescribe the requirements relating to work near underground telecommunications lines.

2.2 Before carrying out any underground work, the working party shall take all reasonable steps to ascertain whether an underground telecommunications line exists within or near the proposed work site in accordance with the Guidelines. If the telecommunications lines layout plans supplied by any of the relevant FNOs indicate that an underground telecommunications line exists or is likely to exist within or near the proposed work site within the separation distance specified in Table 1 of the Guidelines, the working party shall **appoint a competent person** to carry out the detection work for the telecommunications line.

2.3 This Appendix sets out the approval requirements and procedures for registration of a competent person who is recognised by the CA as competent to perform the relevant duties stipulated in the Guidelines.

Who Should Apply

2.4 Any person who wishes to be a competent person for the purpose of the Guidelines should make a written application to OFCA.

Qualification Requirements for Approval as a Competent Person

2.5 To be qualified for approval as a competent person, the applicant should meet the following requirements—

(a) the applicant is a competent person approved by Electrical and Mechanical Services Department ("EMSD") under the Electricity Supply Lines (Protection) Regulation (Cap. 406H) ("ESLPR") for locating the underground electricity cables and holds a relevant

certificate of approval issued by EMSD with a remaining validity period of at least six months; and

(b) the applicant has attended and passed a training course recognized by OFCA in relation to the detection of underground telecommunications line. The list of recognized training courses provided by third party institutes is available from OFCA's website.

2.6 OFCA may grant its approval to an applicant subject to such conditions as it reasonably thinks fit. Further, OFCA may refuse an application for approval if a previous approval granted to the applicant has been suspended or revoked.

Validity Period of Approval

2.7 An approval as a competent person granted by OFCA shall be valid for a period of three years.

2.8 OFCA will issue to the competent person a certificate confirming the approval and specifying the period of validity of the approval and the conditions, if any, subject to which the approval has been granted. Before the expiry of the period of validity, the competent person shall make an application to OFCA for renewal of approval as a competent person and issue of a new certificate.

Renewal of Approval

2.9 Application for renewal of approval as a competent person shall be made at least one month before, but not earlier than four months before, the expiry of the current approval.

2.10 An approval which is renewed based on the requirements stated in paragraph 2.5 above shall be valid for a further period of three years.

Suspension or Revocation of Approval

2.11 OFCA may suspend or revoke a person's approval as a competent person if –

(a) the person has been convicted of an offence under section 22A of the Ordinance;
(b) the person has failed to or no longer capable of performing the duties of a competent person;
(c) the person obtained his/her approval by fraud or on the basis of misleading or inaccurate information;
(d) the approval was granted in error;
(e) the person has acted in breach of any condition of the approval; or
(f) the approval granted to the person by EMSD as a competent person under ESLPR has been suspended or revoked.

Notice of Change of Particulars

2.12 Where there is any change in the particulars of the name or address of a person who is approved as a competent person, the person shall give written notice to OFCA of the changed particulars within 21 days after the change takes place.

How to Apply

2.13 Application for approval or renewal of approval as a competent person shall be made to OFCA. The application is free of charge. The applicant may submit application following the procedures below:

(a) Obtain application form from:
  (i) OFCA website or
  (ii) OFCA office in 29/F, Wu Chung House, 213 Queen's Road East, Wan Chai, Hong Kong
(b) Complete the application form according to the requirements stipulated therein
(c) Submit the completed application form together with supporting documents:
  (i) in person or by post to:
  Section 12, Market and Competition Branch, OFCA, 29/F, Wu Chung House,
  213 Queen's Road East, Wan Chai, Hong Kong;
  (ii) by fax to 2123 2187; or
  (iii) by email to: cp-application@ofca.gov.hk

Appendix 3 Tracer Wire Reference

Introduction

3.1 Toroidal active detection is one of the technologies commonly used to ascertain the alignment and depth of underground telecommunications lines. It can provide a non-direct contact method, in which the signal generated by the transmitter of an underground utility locating device is induced to the target underground telecommunications line by the signal clamp around it. Then adjust the receiver to the same frequency to receive the signal at an appropriate position on the ground above the target underground telecommunications line, so that the alignment and depth of the underground telecommunications line can be detected.

3.2 If the underground telecommunications line does not include a suitable metallic conductor/wire to propagate the signal to be induced from the signal clamp, a tracer wire shall be installed for making the relevant underground telecommunications line detectable.

Materials

3.3 Tracer wire shall be made of materials with durability, high breaking strength and good signal propagation characteristics, such as copper or copper-clad steel.

3.4 The outer layer of tracer wire shall be made of materials with anti-corrosion properties and suitable for direct burying, such as high-density polyethylene ("HDPE").

3.5 In general, when selecting related products, FNOs shall choose the products that are manufactured for the purpose of functioning as the tracer wire, and shall ensure the specifications of the related products are suitable for installation as the tracer wire for the concerned underground telecommunications lines.

Grounding

3.6 Tracer wire must be properly grounded at all dead ends (where applicable) for completing the circuit needed for line detection. The grounding of the tracer wire shall be connected to the grounding point in the manhole or jointing chamber, and sufficient space shall be reserved for the signal clamp to be placed for detection.

Installation

3.7 Whenever a new underground telecommunications line (including cable duct) is installed, the tracer wire (where applicable) shall be installed and secured properly at the top of the direct cable or cable duct, as the case may be. Whenever a new telecommunications cable is added to an existing cable duct, the tracer wire shall be added to a proper location such as inside the cable duct. Whenever a maintenance or excavation work is performed to repair, remove, replace or relocate an existing underground telecommunications line or cable, or any combination thereof, the tracer wire shall be added thereto to achieve the same purpose.

3.8 Tracer wire shall not be connected to any conductive objects or facilities except for grounding.

3.9 The tracer wire connected to the grounding point inside the manhole shall be clearly marked for identification.

3.10 Enough space shall be reserved for placing the signal clamp of the locator when installing the tracer wire.

3.11 Connectors of the tracer wires shall be waterproof and corrosion-proof, and able to keep the locate signal flowing across connections.

Appendix 4 Sample of Underground Telecommunications Line Detection Report

Underground Telecommunications Line Detection Report

Site name:	XYZ House
Site address:	88 XYZ Road, Hong Kong
Scope/Nature of work:	Trench work
Name of contractor:	ABC Construction Co. Ltd
Date of completion for Section D:	21th October 202X
Date of completion for Section E:	29th October 202X

Record no.: ABC_001

Contents

A. Basic information

I CHAN Dai Ming the Competent Person ("CP")
Registration no.: CA-CP000001 Expiry date: 1/12/20XX
of underground telecommunications line detection, in accordance with section 18A of the Telecommunications Ordinance (Cap. 106),

on 202X year 10 month 21 day undertook the preliminary estimation of the location
on 202X year 10 month 29 day undertook the actual alignment and depth detection
of underground telecommunications line,
at 88 XYZ Road, Hong Kong

Detection device used

Item	Brand name	Model no.	Serial no.	Calibration due date	Frequency used	Remark
1	BCD	BCD12345	123456789	15/8/202X	1.5 & 1.8 MHz	Nil
2						

Matters requiring particular attention

FNO-A requested on-site monitoring for trial hole digging.

Declaration by CP

The above mentioned underground telecommunications lines detection was carried out with the assistance of MA Dai Man and he/she was directly supervised by me in the course of the detection.

Signature of CP: chan Date: 29/10/202X

Signature of CP's assistant: ma Date: 29/10/202X
Name: (MA Dai Man)

B. Telecommunications lines layout plans of fixed network operators ("FNOs")

The working party / CP^ (delete as appropriate) has requested and collected the telecommunications lines layout plans from the following FNOs.

Name of FNO	Date of request	Date of layout plans collected	No. of layout plan collected
FNO-A	18/8/202X	25/8/202X	1
FNO-B	18/8/202X	26/8/202X	2

The working party / CP^ (delete as appropriate) has requested the telecommunications lines layout plans from the following FNOs. They indicated that they do not have underground telecommunications lines within or near the work site.

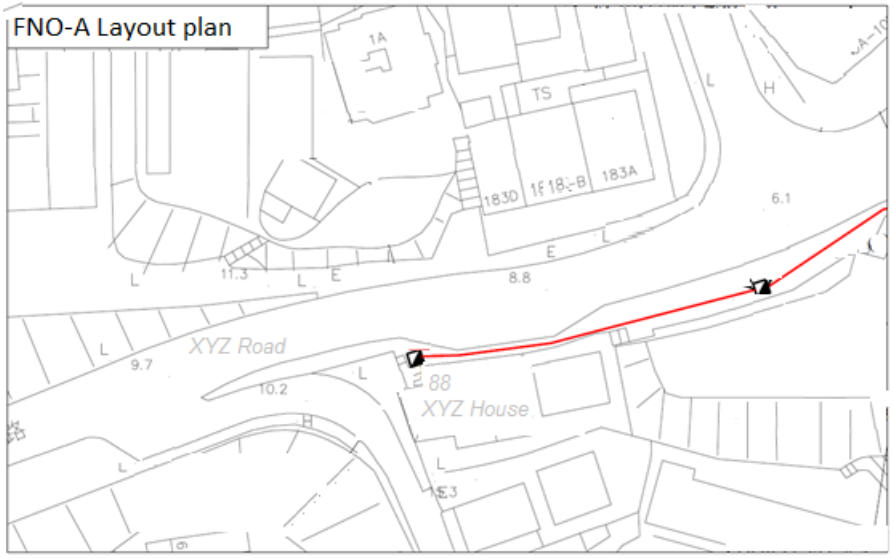
Name of FNO	Date of request	Date of view received
FNO-C	18/8/202X	25/8/202X
FNO-D	18/8/202X	25/8/202X
FNO-E	18/8/202X	25/8/202X
FNO-F	18/8/202X	25/8/202X
FNO-G	18/8/202X	25/8/202X

Underground Telecommunications Line Detection Report

Record no.: ABC_001

Details of telecommunications lines layout plan:

Name of FNO	Layout plans collected page no. / total no. of page
FNO-A	1 / 1



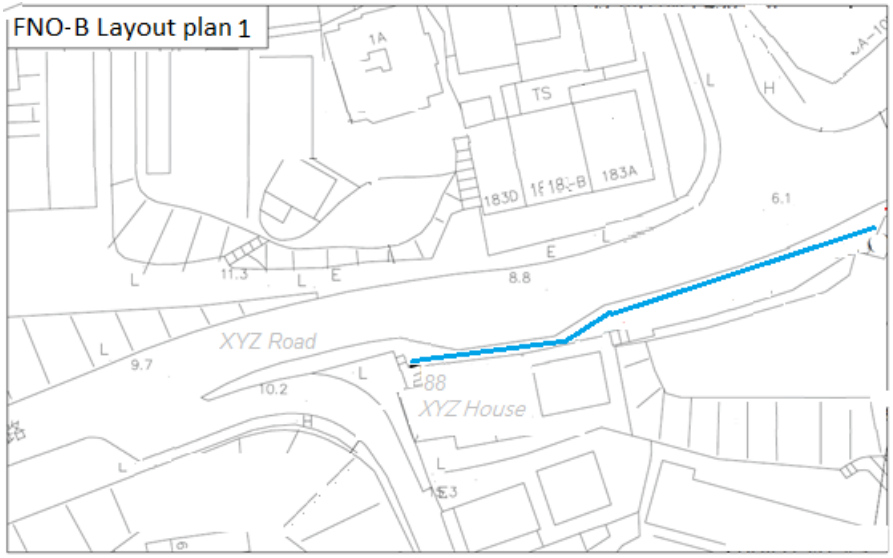
Underground Telecommunications Line Detection Report

Record no.: ABC_001

Page : 5

Details of telecommunications lines layout plan:

Name of FNO	Layout plans collected page no. / total no. of page
FNO-B	1 / 2

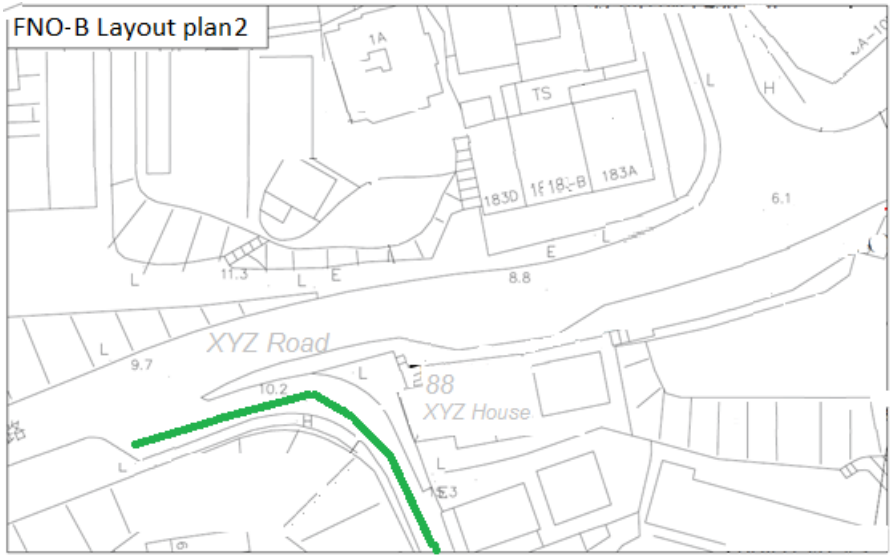


Underground Telecommunications Line Detection Report

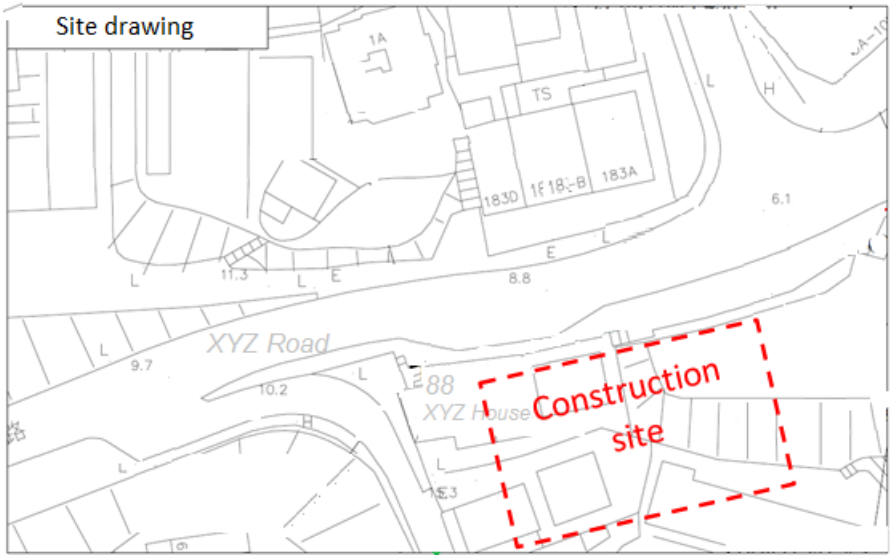
Record no.: ABC_001

Details of telecommunications lines layout plan:

Name of FNO	Layout plans collected page no. / total no. of page
FNO-B	2 / 2



C. Work site drawings



D. Preliminary estimation of the location of underground telecommunications lines

D.1 Work procedures

Date/Time	Telecommunications lines detection work procedure	Relevant photo no.
21/10/202X at 10:30	We could not locate the alignment of FNO-B's underground telecommunications line by using the passive detection method.	Photo 1 and Photo 2
21/10/202X at 11:00	I proposed the trial hole location for carrying out the active detection by referring to the FNO-As' telecommunications lines layout plans.	
21/10/202X at 11:30	We marked the proposed trial hole location and the vicinity.	Photo 3

Underground Telecommunications Line Detection Report

Record no.: ABC_001

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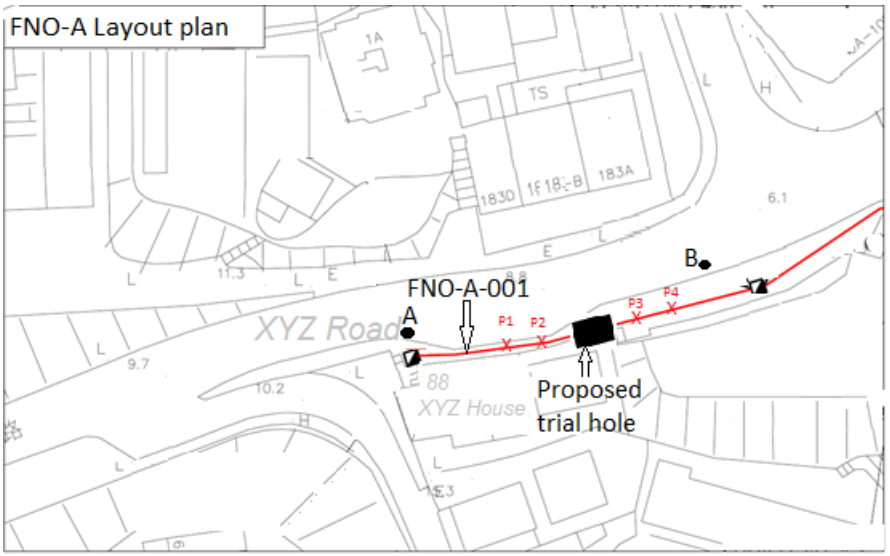
D.2 Preliminary measurement records

Measure-ment Point	Distance from reference Point(A)*		Distance from reference Point(B)*		Detected depth from ground level* (mm)	Remarks (telecommunications line information**)
	Actual (m)	On map (mm) in ratio 1 : 300	Actual (m)	On map (mm) in ratio 1 : 300		
P1	9	30.0	18	60.0	To be determined (TBD)	A manhole with FNO-A's name was found near point A
P2	12	40.0	15	50.0	TBD	
P3	18	60.0	9	30.0	TBD	
P4	21	70.0	6	20.0	TBD	

* Deviation is less than 25%.

** Telecommunications line information may include colour of duct, name of the fixed network operator being marked on the duct, and other particulars that may help determine the identity of the telecommunications lines under detection.

D.3 Diagram showing estimated location of underground telecommunications line and proposed locations including trial hole locations for carrying out detection work to ascertain alignment and depth of the line



Legend:
(For reference only)

X : Measurement point
D : Telecommunications line depth (mm)
--- : Telecommunications line alignment
A : Reference point A
B : Reference point B

A
D
---------- ----- X ----- ----------
B

Remark: The telecommunications lines layout plan should include all the relevant details to clearly indicate the location information of the telecommunications line(s), such as site area, line alignment, reference point, sequence number of measurement points, line depth, number of lines, proposed trial hole location, kerb, building line, manhole, junction box, lamppost, etc.

Ratio 1 : 300

D.4 Photographs showing the detection work and proposed trial hole location

Photo 1. Cable detection was carried out

Photo 2. Cable detection area

Photo 3. Marked the proposed trial hole location

D.5 Site briefing records (before detection work)

I have briefed the content of Section D of this Underground Telecommunications Line Detection Report to the following site personnel of the working party, in particular the number of target underground telecommunications lines, proposed locations for detection work, and other details of this report.

Date of briefing : 21/10/202X

Name	Post	Signature
POON Dai Kong	Site agent	Poon
MA Dai Leung	Foreman	Ma
CHEUNG Dai Hing	Operator	Cheung
KWOK Dai Fong	Worker	Kwok

Signature of CP : Chan

Name of CP : CHAN Dai Ming

E. Actual alignment and depth of underground telecommunications lines

E.1 Work procedures

Date/Time	Telecommunications lines detection work procedure	Relevant photo no.
29/10/202X at 12:30	Workers of ABC construction company dug the trial hole.	
29/10/202X at 13:00	We carried out toroidal active detection.	Photo 1
29/10/202X at 13:30	We marked the FNO-A's underground telecommunications line alignment & depth on site.	Photo 2 and Photo 3
29/10/202X at 14:30	I gave the site briefing to ABC construction company site personnel.	

Underground Telecommunications Line Detection Report

Record no.: ABC_001

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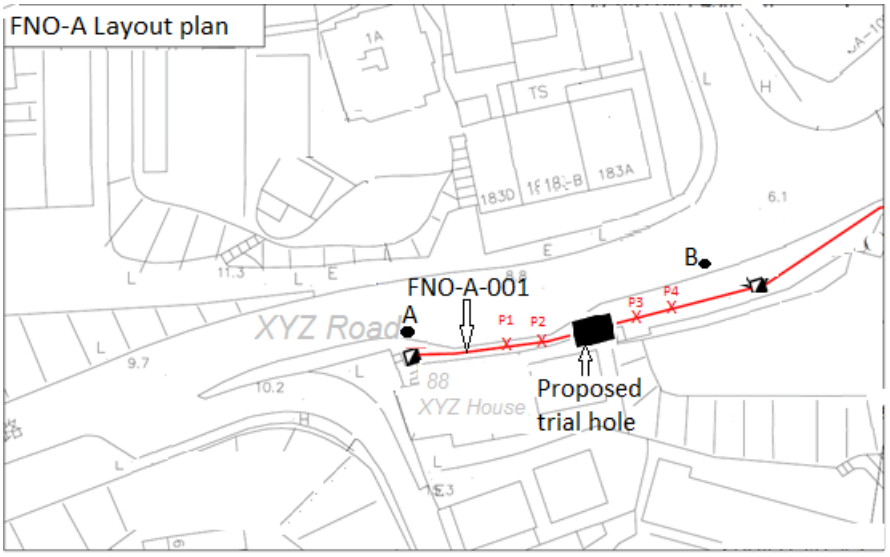
E.2 Measurement records

Measurement point	Distance from reference point (A)*		Distance from reference point (B)*		Detected depth from ground level* (mm)	Remarks (telecommunications line information**)
	Actual (m)	On map (mm) in ratio 1 : 300	Actual (m)	On map (mm) in ratio 1 : 300		
P1	9	30.0	18	60.0	800	FNO-A-001
P2	12	40.0	15	50.0	900	FNO-A-001
P3	18	60.0	9	30.0	800	FNO-A-001
P4	21	70.0	6	20.0	850	FNO-A-001

* Deviation is less than 25%.

** Telecommunications line information may include colour of duct, name of the fixed network operator being marked on the duct, and other particulars that may help determine the identity of the telecommunications lines under detection.

E.3 Diagram showing actual alignment and depth of underground telecommunications line



Legend:
(For reference only)

X : Measurement point
D : Telecommunications line depth (mm)
--- : Telecommunications line alignment
A : Reference point A
B : Reference point B

A
D
---------- ----- X ----- ----------
B

Remark: The telecommunications lines layout plan should include all the relevant details to clearly indicate the location information of the telecommunications line(s), such as site area, line alignment, reference point, sequence number of measurement points, line depth, number of lines, proposed trial hole location, kerb, building line, manhole, junction box, lamppost, etc.

Ratio 1 : 300

E.4 Photographs showing the conducted detection work

Photo 1. Active detection was carried out

Photo 2. Marked the cable alignment & depth

Photo 3. Marked the cable alignment & depth

E.5 Site briefing records (after detection work)

I have briefed the content of Section E of this Underground Telecommunications Line Detection Report to the following site personnel of the working party, including operators of excavator/machine and workers engaged in the excavation work, in particular the meaning of markings, the potential risk of damage of telecommunications lines and the precautionary measures that have to be taken, and explained other details of this report.

Date of briefing : 29/10/202X

Name	Post	Signature
POON Dai Kong	Site agent	Poon
MA Dai Leung	Foreman	Ma
CHEUNG Dai Hing	Operator	Cheung
KWOK Dai Fong	Worker	Kwok

Signature of CP : Chan

Name of CP : CHAN Dai Ming

F. FNOs' advice

FNOs' advice, such as advice sought and received from FNOs (if any) on major discrepancies of telecommunications lines alignment detected on site.		
Date	FNO	Description
29/10/202X	FNO-B	The underground telecommunications line shown in the layout plan provided by FNO-B could not be located. We discussed this issue with FNO-B and it was confirmed that their underground telecommunications line shown in the layout plan had been relocated to the location outside the proposed work site, and their underground telecommunications line should not be affected by the proposed underground work.

Record no.: ABC_001

G. Other relevant information

FNO-A informed that the concerned fibre cable is providing telecommunications services to a
Data Centre nearby. Any damage to it will result in interruption of its customers' data services.
During the underground work, if the working party finds the underground telecommunications
line or its associated uPVC is damaged, contact should be made with Mr. Chan of FNO-A
(tel: 9991-9991) immediately.