

Ref: HYD 4/1/10

Tel: 368 2734

**HIGHWAYS DEPARTMENT
10/F, EMPIRE CENTRE
68 MODY ROAD
TSIM SHA TSUI EAST
KOWLOON**

19 September 1990

Highways Department Technical Circular 3/90
Minimum Cover Requirement for Underground Services

1. Introduction

- 1.1 Paragraph 12 of the standard Conditions of Permit (Form HYD 15 published in July 1989) for Excavation Permits issued under the Crown Lands Ordinance gives the minimum cover requirement for services laid under a public road. Subsequently there have been discussions with the utility undertakers regarding a larger cover near the kerblineline to facilitate construction of deep sump gullies and regarding the cover to high tension power cables. The purpose of this Circular is to consolidate the different requirements. The opportunity is also taken to clarify some basic concepts and to lay down the approach to take in dealing with requests to waive the minimum cover requirement.

2. General Concepts

- 2.1 The basic reasons for specifying a minimum cover for underground services are to:-
- a) avoid any adverse effects on the structural integrity of the road pavement;
 - b) afford protection to the buried services from damage due to traffic loadings;
 - c) afford protection to the buried services from damage due to subsequent road opening works;
 - d) afford protection to personnel carrying out road opening works from cutting into energised services located at an unexpected shallow depth; and
 - e) maximise the use of underground space for the accommodation of services while ensuring that sufficient space is reserved for the installation of surface drainage system which is essential for the proper operation of a highway.

- 2.2 It should be borne in mind that while services laid at a greater depth will create less obstruction to the subsequent laying of other services, there are other considerations. With road crossings, the greater the depth at which the services are installed the more costly and also the more disruptive to the public it is to construct, locate and maintain. The depth of the services can also have an effect on adjacent structures, e.g. walls, buildings or carriageways. Utility undertakers should NOT be encouraged to place their services at a depth greater than is necessary.
- 2.3 For the purpose of defining the minimum cover requirement, a road in cross section is divided into the following zones:-
- a) footway zone which is the part of the footway beyond 300 millimetres from the kerblines;
 - b) kerb zone which is made up of the part of the footway within 300 millimetres from the kerblines and the part of the carriageway within 2 000 millimetres from the kerblines; and
 - c) carriageway zone which is the part of the carriageway other than the two strips within 2 000 millimetres from the kerblines.
- 2.3.1 The part of a cycleway outside the kerb zone shall be considered as part of a footway zone.
- 2.3.2 Where a section of road is superelevated in cross section, if an officer is satisfied that there are no existing or proposed gullies at the higher edge of the carriageway, he may reduce the minimum cover requirement for the kerb zone at the higher edge to that appropriate to the carriageway zone.
- 2.4 In certain cases it is necessary to ask utility undertakers to divert or lower their services to suit road improvement works soon after the services are laid. Such diversion or lowering works could be avoided if the utility undertakers are aware of the road improvement proposals and are asked to place their services, at the time when they were laid, to suit the final road layout. In determining the appropriate minimum cover in processing Excavation Permit applications, officers should take into account any likely changes in the layout of the roads concerned as a result of some known road improvement proposals. The following are two common cases where appropriate modification would have to be made.

- a) Some footways are known to be affected by road widening proposals. For services proposed to be laid along that part of a footway which will be turned into carriageway, a minimum cover appropriate to the kerb zone or a carriageway zone shall be specified instead of a minimum cover appropriate to a footway.
- b) Some roads are known to be affected by proposed changes in road levels. If utility works along such roads are proposed, the utility undertakers shall be asked to lay their services at a depth which can satisfy the appropriate minimum cover requirement during both the current stage and the final stage. In cases where the road level is to be raised substantially, an officer of senior professional rank or above may permit the services to be laid at a shallow depth provided that the appropriate minimum cover requirement would be satisfied when the road surface has been raised to the proposed level.

2.5 Central islands and central verges are often turned into carriageway. To avoid the need to divert or lower services laid within central verges and central islands, they should be considered as part of the carriageway as far as the minimum cover requirement is concerned. All services laid within central islands and central verges shall be at a depth which will satisfy the minimum cover requirement appropriate to the adjacent carriageway provided that:

- a) this requirement shall not apply to lighting cables and irrigation pipes;
- b) officers concerned should use their discretion in fixing the cover requirements for those central verges separating two carriageways of different levels; and
- c) an officer of the rank of senior professional or above may allow a shallower cover at wide central verges in the rural area if there are justifications to do so.

3. Services other than high tension power cables of 33kV or above

3.1 Footway zone

The minimum cover from the surface of the footway to the top of the services shall be 450 millimetres provided that

- a) where the proposed services or installations occupy more than half the width of the footway, the minimum cover shall be increased to 900 millimetres, and
- b) for non-energised services, which include telecommunication cables but exclude power cables, water mains and gas mains, laid in ducts involving a maximum of two cable ducts of nominal diameter 100 millimetres or less, the minimum cover can be reduced to 300 millimetres provided that conspicuous identification devices are provided above the services.

3.2 Kerb zone

The minimum cover from the surface of the carriageway to the top of the services for services running along the kerb zone shall be 1 500 millimetres provided that the laying of services within the zone cross hatched in Figures 1 and 2 at the Appendix is permitted if the proposed services are not in conflict with the enlisting or proposed gully connection. The minimum cover for services crossing the kerb zone shall be 900 millimetres in case of a carriageway and 450 millimetres in case of a cycleway or a footway.

3.3 Carriageway zone

The minimum cover from the surface of the carriageway to the top of the services shall be 900 millimetres.

4. High tension power cables of 33kV or above

4.1 Footway zone

The minimum cover from the surface of the footway to the top of the services shall be 1 000 millimetres. This is the Power Companies' desirable minimum burial depth.

4.2 Kerb zone

The minimum cover from the surface of the carriageway to the top of the high tension power cables twining along the kerb zone shall be 1 500 millimetres. The minimum cover for high tension power cables crossing the kerb zone shall be 1 000 millimetres.

4.3 Carriageway zone

The minimum cover from the surface of the carriageway to the top of the services shall be 1000 millimetres.

4.4 Additional Requirements

Where a high tension power cable affects an existing or a proposed gravity type utility service (stormwater drain or sewer), or where a high tension power cable runs along the frontage of some known development / redevelopment sites to which a number of utility connections would be made, an officer of senior professional rank or above may specify a larger cover, say 2 metres, to provide a reserve for the laying of the gravity type services or utility connections. The increased cover should NOT be made a general requirement and should be determined after taking due account of the particular site conditions.

5. Applications for the waiving of the minimum cover requirement

5.1 Approach in dealing with applications

5.1.1 A flexible approach should be taken in dealing with applications for the waiving of the minimum cover requirement. In addition to the basic reasons mentioned in paragraph 2.1 above, the following factors should be taken into account :

- a) Re-routing the services, for instance relaying the services concerned along a much longer route or shifting the services concerned from the footway onto the carriageway, may create additional disruptions of a significant degree to the public.
- b) Some roads are already congested with existing services and it may not be possible to install the proposed services under the existing ones without occupying large works areas for long periods diverting some existing services and creating substantial disruptions and inconvenience to the public.
- c) Services laid at shadow depth, in particular those of large diameter or large size, would obstruct access to other services at a lower level and may sterilise some underground space. However short sections of services laid at a shadow depth to cross over existing ones have minimal effect in this respect.

5.1.2 An applicant shall be asked to submit justifications to support the application. Officers concerned should make a sensible balance between any additional disruptions to the public and possible sterilisation of underground space in deciding whether to approve or reject the application. Any decision to waive the minimum cover requirement shall be endorsed by an officer of the rank of senior professional or above.

5.2 Protective cap for power cables and was mains

For power cables or gas mains to be laid with a cover less than the minimum requirement, the permittee shall be required to provide a protective cap such as concrete tiles or a steel plate above the these services along the entire length with substandard cover to prevent injury to workmen as a result of accidental cutting into these services.

Original Signed

(S. K. Kwei)
Director of Highways