

GOVERNMENT'S EFFORTS IN MANAGING EXCAVATION WORKS ON PUBLIC ROADS

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1. Apart from carrying vehicular and pedestrian traffic, most of the 2,107 kilometres of public roads in Hong Kong also provide underground space for accommodating utility services. Road works are necessary from time to time for the installation, maintenance, repair and improvement of road sections and/or the public utilities underneath. According to the Transport Advisory Committee's Report of December 2014, road works were a major cause of road traffic congestion. Under the policy directives of the Development Bureau (DEVB), the Highways Department (HyD) coordinates and controls road openings through issuing excavation permits (XPs) to the works proponents, including government works departments and other utility undertakings (UUs). According to the Land (Miscellaneous Provisions) Ordinance (LMPO — Cap. 28), a person has to obtain an XP from the HyD for making or maintaining an excavation on streets maintained by the HyD over unleased government land (hereinafter referred to as public roads) and a land licence from the Lands Department (LandsD) for installing utility facilities. As an incentive for permittees to complete their works within the approved timeframe, the Government has imposed XP fees with special charging mechanism (an administration fee of \$650 and a daily fee of \$35 plus economic cost based on the traffic impact an excavation can cause) for permit extension since April 2004. In 2016-17, XP fees of \$180 million were collected. The costs associated with the coordination and control of road openings were incorporated in the HyD's 2016-17 expenditure of \$1,433.4 million on the programme area of district and maintenance works. Of the 1,011 staff working under the programme area in December 2017, 113 staff were responsible for matters relating to administration of road opening works. The Audit Commission (Audit) has recently conducted a review of the Government's efforts in managing excavation works on public roads with a view to identifying areas for improvement.

Management and monitoring of road excavation works

2. The two Regional Offices (i.e. Urban and New Territories) of the HyD are responsible for processing and issuing XPs using a web-based Excavation Permit Management System (XPMS). In 2016, the HyD issued 21,822 XPs comprising

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8,911 normal excavation permits (NXPs — for planned openings with a diameter of 450 metres (m) or less), 10 capital works excavation permits (CWXP — for planned openings with a diameter exceeding 450 m), emergency excavation permits (EXPs) for 11,171 emergency incidents and 1,730 small-scale works excavation permits (SSWXP — for areas of excavation each not exceeding 4 square metres and length of excavation not exceeding 6 m). If a permittee of an NXP or CWXP cannot complete the works within the specified XP period, it needs to apply for an extension. Extension is not normally allowed for an EXP or SSWXP. A permittee needs to complete excavation works within 7 days for each emergency incident under an EXP, and within 24 hours for each job affecting carriageway or within 48 hours for each job not affecting carriageway under an SSWXP (paras. 1.6, 2.2 and 2.3).

3. ***Need to remind government works departments to strengthen investigation of underground conditions before applying for XPs.*** While the total number of NXPs and CWXPs decreased from 13,297 in 2010 to 8,921 in 2016, the number of XPs with extension increased by 78% from 727 in 2010 to 1,293 in 2016. As a result, the number of XPs with extension as a percentage of NXPs and CWXPs authorised increased from 5% to 14%. The average extension period also increased by 90% from 48 days to 91 days during the period. Based on an analysis of the XPMS records as of November 2017, of the 1,061 XPs issued in 2016 which were granted extensions, 517 XPs (49%) were related to government departments, 348 (33%) to other UUs and 196 (18%) to infrequent applicants (i.e. ad hoc applicants). According to the HyD, obstruction by existing underground utilities, difficult underground conditions and inclement weather are common grounds for the extension of XP period. In view of the large percentage of extended XPs involving government projects, the DEVB should remind works departments to make greater efforts to ascertain the underground conditions before applying for XPs (paras. 2.3 to 2.5).

4. ***Need to improve the coordination of road openings in close proximity.*** In processing NXP applications for proposed works, the Regional Offices would check whether there are other proposed works plans within 30 m, and if so, the concerned applicants would be requested to coordinate their works (e.g. to group the excavations using a common trench) to avoid repeated openings. The HyD in general will not issue an XP on the same road section within three months (for other applicants) or six months (for the same applicant), except for emergency cases. Audit examination revealed that the HyD had not compiled statistics on the coordination work to evaluate the effectiveness of such a measure in reducing road openings. For ungrouped excavation works at the same location, the HyD would issue an XP if an applicant revised the works schedules to include a time break of three months or more but there

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was no requirement on the applicant to provide the justifications for failing to use a common trench for the proposed works. In these cases, the concerned excavation works were only deferred without any reduction in the number of road openings. Audit also noted that of 8,909 proposed works plans requiring coordination as of November 2017, 4,093 plans (46%) had remained uncoordinated for over two years. However, the XPMS did not keep information on whether these long-outstanding plans had become obsolete or had been abandoned. Audit's sample check revealed that in some cases, the HyD had required the applicants to coordinate their proposed works with other proposed works which were unlikely to have any conflicts among them, e.g. works located outside the 30-m boundary. This might affect the efficiency of coordination work (paras. 1.8(b) and 2.7 to 2.11).

5. ***Audit Inspection Team (AIT) inspections during excavation works.*** The HyD has established an AIT under its Research and Development Division to inspect XP sites for monitoring compliance with the XP conditions by permittees and their nominated permittees. Demerit points will be assigned to a permittee for any non-compliant items and sanction will be imposed if the overall demerit point is at 4 or above (paras. 1.8(e) and 2.19). Audit examination has revealed the following areas for improvement in AIT inspections:

- (a) ***Need to improve the inspection coverage of NXP and CWXP sites.*** According to the HyD, all XPs should be subject to at least one checking after commencement of works. Audit examination of the XPs issued in 2016 revealed that the overall coverage of the AIT inspection on active permit sites up to December 2017 was only 43%. Audit understands that there may be practical difficulty to cover all EXPs and SSWXPs given the large number of active permit sites and the short duration of these sites. However, there is a need to improve inspection coverage of NXPs and CWXPs for which the excavation works generally last longer, to ensure that the XP conditions have been complied with (paras. 2.20 and 2.21); and
- (b) ***Need to enhance compliance with XP conditions.*** While the compliance rate of XP conditions from 2013 to 2016 was 98.9% in general, the four frequently observed non-compliant items (viz. no continuous barriers to fence off obstruction or excavation from pedestrian flow; minimum clear footway width not provided and maintained for pedestrians; permit not displayed; and signs not provided in accordance with the approved temporary traffic arrangement) had remained at the same level over the period. Audit noted that among the permittees, the average number of the

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non-compliant items per permit in 2017 was higher for infrequent applicants (2.68) than for government departments (0.16) and for other UUs (0.3). The HyD needs to take measures to enhance compliance with the four frequently observed non-compliant items, e.g. considering stepping up publicity efforts with a view to promoting compliance with XP conditions, especially by infrequent applicants (para. 2.22).

6. ***Checking completion of works.*** When an XP expires or upon receipt of a Completion Notice (CN), the responsible Regional Office will arrange a CN inspection within seven working days to confirm works completion and acceptance of road reinstatement. If the reinstatement does not comply with the relevant requirements/specifications, the HyD will reject the permanent reinstatement (hereinafter referred to as “rejected CN”) and request the permittee to rectify the problem (para. 2.23). Audit examination has revealed the following areas for improvement:

- (a) ***Increase in substandard reinstatement works.*** While the number of XPs authorised decreased over the years, the number of rejected CNs was generally increasing (from 5,294 in 2011 to 6,191 in 2017), indicating an increase in substandard reinstatement works carried out by contractors (para. 2.24(a));
- (b) ***Long-outstanding rectification works.*** Of the 6,779 rejected CNs pending rectification of the reinstatement works as at December 2017, 2,581 (38%) had remained outstanding for over two years. There is safety concern for road users if substandard reinstatement works cannot be rectified in a proper and timely manner (para. 2.24(b));
- (c) ***Inspections for CNs not timely conducted.*** Of the 2,019 CN cases under processing as at the end of December 2017, the CN inspections and acceptance in respect of 1,297 (64%) cases were overdue by 1 month on average (5 months for the longest overdue case) (para. 2.24(c)); and
- (d) ***Delays in submitting and processing site photographs and test reports.*** Permittees are required to submit site photographs and test reports for the HyD to determine whether the standard of their reinstatement works is up to its satisfaction. However, as of December 2017, 3,618 site photographs and 2,441 test reports had not been submitted to the HyD, of which 483 (13% of 3,618) photographs and 771 (32% of 2,441) test reports had

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been outstanding for over three years. On the other hand, of 15,626 site photographs and 7,486 test reports submitted, 4,842 (31% of 15,626) photographs and 2,523 (34% of 7,486) test reports had not been reviewed by the Regional Offices for over three years (para. 2.24(d) and (e)).

7. ***Enforcement actions.*** According to the LMPO, any person who carries out road excavations without an XP/EXP or breaches any conditions of XP/EXP shall be guilty of an offence. Since 2009, the HyD has adopted a compliance-led approach to encourage permittees to rectify non-compliance with the XP conditions promptly by issuing an advisory letter if any contravention is found by the AIT. For non-compliance with the same inspection items after an advisory letter has been issued, the AIT refers the case to the Enforcement Team (ET) for conducting an independent investigation. If sufficient evidence is collected, the ET will make recommendations to the Department of Justice for instituting prosecutions. From 2013 to 2016, of the 4,338 cases referred to the ET for enforcement actions, only 162 (4%) cases proceeded to prosecutions. According to the HyD, as many non-compliant items had been rectified before the ET's inspections and the majority of the public complaint cases turned out to be invalid, no prosecutions had been taken for the remaining 4,176 cases (paras. 2.27 and 2.28). Audit examination has revealed the following areas for improvement:

- (a) ***Need to step up enforcement actions against serious and repeated non-compliant cases.*** The AIT only referred cases of serious and repeated non-compliance with permit conditions to the ET for taking enforcement actions. The number of such cases increased from 902 in 2013 to 1,446 in 2017, indicating an increasing trend in serious and repeated non-compliant cases. However, the number of cases proceeded to prosecutions totalled 209 from January 2013 to November 2017 because the permittees had been informed of the non-compliant results before the cases were referred to the ET and the bulk of the non-compliance had been rectified before the ET's inspections. There is a need to review the referral mechanism from the AIT to the ET for conducting prompt investigations and consideration of prosecution actions against serious and repeated non-compliant cases (para. 2.29); and
- (b) ***Need to review the referral mechanism on suspected breaches of the safety-related provision of the LMPO for conducting prompt investigations by the ET.*** Under section 10T of the LMPO, any contravention of the statutory provision to protect the safety of public or

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workers when making or maintaining an excavation would be liable to a maximum fine of \$200,000. From 2015 to November 2017, the HyD had not taken any prosecution actions on 84 cases of suspected breaches of section 10T of the LMPO. Audit's sample check of 10 such cases detected by the AIT's inspections revealed that the ET could not obtain sufficient prosecution evidence because: (i) in 4 cases, the cases were referred to the ET after the permittees had notified the AIT of the completion of the rectification works; and (ii) in 5 cases, the AIT referred the suspected-breach cases to the ET through advisory letters 3 to 6 days after its inspections, and there was a time gap of 6 to 8 days between the AIT's inspections and the ET's inspections (paras. 2.31 to 2.33).

Control of underground utility installation and space occupation

8. ***Problems caused by congested utilities.*** As of December 2017, there were 18 major UUs (12 telecommunications UUs and 6 other UUs) installing their utility services beneath public roads, up from 10 (4 telecommunications UUs and 6 other UUs) in 1995, mainly due to the increase in the number of UUs providing fixed telecommunications services. According to the HyD's consultancy report of December 2017, there was no standard mechanism to manage space occupation by UUs underneath public roads. Ineffective underground space management might cause improper use of space, damage to existing utilities, and delays in emergency repairs and excavation works (paras. 3.2 and 3.3).

9. ***Need to improve control of underground utility installation.*** Audit examination has revealed the following areas for improvement:

- (a) ***Non-compliance with minimum-depth requirements.*** In 2011 and 2012, the HyD received over 500 complaints relating to the breach of minimum-depth requirements of the XP condition. After investigation, the HyD found that in 203 cases involving six fixed network operators, the installation works did not meet the minimum-depth requirements. Up to January 2018 (about 4 years later), 3 non-compliant cases had not been rectified (para. 3.9); and
- (b) ***Need to strengthen control over alignment and disposition of underground utility installation.*** In 2010, the LandsD and the HyD received complaints

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on the erection of telecommunications poles on public pavements by a UU. The HyD found that 487 poles had been erected using the SSWXP procedures inappropriately and the CNs of 180 poles had been approved by the HyD. The HyD subsequently withdrew the approvals and upon the LandsD's request, the UU removed the poles. The unauthorised works in this case suggested inadequate checking of the completed works and some control weaknesses under SSWXP (i.e. without a requirement on UUs to provide details of proposed installations). While the HyD revised the SSWXP procedures in 2011 requiring works proponents to obtain the HyD's consent before carrying out non-standard works items (e.g. poles and other above-ground installations), there was no similar requirement for underground utility installations. According to the land licence condition, for utility installation, detailed alignment and disposition of the system in, on, over, along, across and under any public road or within any future road reserve shall be to the satisfaction of the Director of Highways. However, as shown in this case, the HyD did not check whether such alignment and disposition were up to its satisfaction. This situation is unsatisfactory as it is difficult to check the alignment and disposition of underground utility installations after reinstatement of road surface (paras. 3.11 and 3.12).

10. *Need to improve management and control of underground space occupation.* Both the master plan submitted by a UU upon land licence application and the road-opening plan submitted upon XP application do not show detailed records of the underground utility installations. As such, the HyD does not possess sufficient underground utility information to determine whether excavation works should be allowed. The HyD has therefore established forums to improve coordination among various government departments and UUs. As shown in paragraph 9 above, there is no assurance that the alignment and disposition of underground telecommunications systems have been installed to the satisfaction of the HyD because the Government does not maintain as-built records on such installations beneath public roads/unleased government land. While the HyD had commissioned a consultancy study in March 2013 to identify an effective system to tighten control over excavation works in areas with congested underground utilities, participating UUs found it difficult to add/modify their alignment plans and questioned the accuracy of the trial system. The HyD needs to, in collaboration with the LandsD, the DEVB and other bureaux with policy responsibilities on utilities, explore the development of an effective management and control system over underground space occupation (paras. 3.13 to 3.16).

Exploring the use of common utility enclosures

11. *Long time taken in exploring the possible use of Common Utility Enclosures (CUEs).* The conventional approach of opening trenches in carriageways/footways for laying utility services is simple but has the disadvantages of causing disruption to vehicular/pedestrian traffic, and resulting in adverse environmental and social impacts. Internationally, a common approach to minimising the problems associated with utility provision in urban areas is to accommodate multiple utilities within a single structure beneath carriageways/footways. The different ways of housing underground utility services within single structures are collectively referred to as CUEs. Using CUEs to accommodate underground utility services has the advantage of reducing the need for road openings, thereby reducing traffic delays and nuisance to the public. The HyD's consultancy study of 2002 confirmed the technical viability of CUE though its implementation would be limited to new town development and subject to cost-and-benefit analysis. While the 2002 study recommended that some pilot schemes should be carried out in the Kai Tak Development to test and refine the implementation arrangements, only two trial CUEs were constructed in Yau Ma Tei and Chung Hom Kok in 2006. In 2011, the HyD decided not to construct trial CUEs in the Kai Tak Development because of limited benefit. The issue on the possible use of CUE was only revived in August 2017 after the publication of the Report of "Consultancy Study on Smart City Blueprint for Hong Kong" in June 2017 to support the smart city planning and development in Hong Kong. After obtaining the DEVB's policy support in August 2017, the HyD planned to conduct another consultancy study in 2018 on adopting CUEs in new development areas (paras. 4.2 to 4.4 and 4.12). Audit examination has revealed that the HyD could draw on the experience in constructing/planning trial CUE schemes to improve the installation of CUEs in new development areas:

- (a) *Low utilisation of trial CUEs and no evaluation of trial results.* The HyD had not consulted the relevant UUs on the selection of locations before constructing the two trial CUEs in 2006. While the trial CUE in Yau Ma Tei was close to the West Kowloon development area, the one in Chung Hom Kok was located in a low-density residential area. Up to January 2018, there were only two UUs utilising the trial CUE in Yau Ma Tei and one UU utilising the trial CUE in Chung Hom Kok. The HyD only planned to evaluate the trial results of the two CUEs in the 2018 consultancy study (paras. 4.5 and 4.15); and

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- (b) ***Proposed trial CUEs in Kai Tak Development not timely planned.*** While the 2002 consultancy study proposed to implement trial CUEs in the Kai Tak Development, the HyD had kept the planning of the proposed trial in abeyance until August 2009 when the Civil Engineering and Development Department (CEDD) sought the HyD's view of putting some pilot CUE facilities to trial in the Kai Tak Development. In November 2010, when the CEDD provided the HyD with a list of 14 road junctions for consideration of implementing trial CUEs, the construction works had already commenced, i.e. 8 road junctions under construction, leaving only 6 road junctions with potential for constructing the trial CUEs. In the event, the HyD decided in February 2011 not to construct any trial CUEs because of the limited benefit (para. 4.16).

Audit recommendations

12. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Government should:**

- (a) **remind works departments to make greater efforts to ascertain the underground conditions, particularly in locations of potential conflicts between utilities and the permanent works before applying for XPs (para. 2.13);**
- (b) **compile statistics on coordination work, and periodically review and clear long-outstanding obsolete/abandoned plans in the XPMS (para. 2.12(a) and (c));**
- (c) **make greater efforts to improve the AIT inspection coverage for NXP and CWXP sites, and take measures to enhance the compliance with XP conditions (para. 2.25(a) and (b));**
- (d) **take measures to improve the permittees' reinstatement works and expedite actions to address the problem of long-outstanding rectification works (para. 2.25(c));**
- (e) **take appropriate improvement measures to ensure that CN inspections are carried out in a timely manner (para. 2.25(d));**

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- (f) **review the referral mechanism from the AIT to the ET for conducting prompt investigations and consideration of prosecution actions on cases of serious and repeated non-compliance with XP conditions, and suspected breaches of the safety precautions and support provisions under section 10T of the LMPO (para. 2.34);**
- (g) **expedite action to rectify the three outstanding non-compliant cases of minimum-depth requirement (para. 3.17(a));**
- (h) **consider enhancing the procedures and requirements on checking the alignment and disposition of underground utility systems (para. 3.17(c));**
- (i) **in collaboration with the LandsD, the DEVB and other bureaux with policy responsibilities on utilities, explore the development of an effective management and control system over underground space occupation (para. 3.17(e));**
- (j) **closely monitor the conduct of the consultancy study in 2018 and upon its completion, take timely follow-up actions on its findings and recommendations (para. 4.17(a)); and**
- (k) **draw on the experience in conducting/planning the trial CUE schemes to improve the installation of CUEs in new development areas and evaluate the effectiveness of the trial CUEs in a timely manner (para. 4.17(b) and (c)).**

Response from the Government

13. The Government agrees with the audit recommendations.