

**GEO Technical Guidance Note No. 14 (TGN 14)
Technical Recommendations for Enhancing the Independent Check of
Design and Construction Review of Rock Slope Excavation**

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1. **SCOPE**

- 1.1 This Technical Guidance Note (TGN) provides technical guidance for enhancing the independent check of design and construction review of rock slope excavation works that are designed by the Contractor and where:
- (i) a slope is of Consequence-to-life Category 1 and/or Economic Consequence Category A; and
 - (ii) the public and/or the facilities in the vicinity may be affected in the event of rockfall during the rock excavation works (e.g. slope works adjacent to a highway in use).
- 1.2 Any feedback on this TGN should be referred to Chief Geotechnical Engineer/Standards and Testing of the GEO.

2. **TECHNICAL POLICY**

- 2.1 The technical recommendations promulgated in this TGN were agreed by the Geotechnical Control Conference (GCC) in July 2003.

3. **RELATED DOCUMENTS**

- 3.1 Environment, Transport and Works Bureau (2002). *General Conditions of Tender (Environment, Transport and Works Bureau Technical Circular (Works) No. 51/2002)*. Environment, Transport and Works Bureau, Government Secretariat, Hong Kong.
- 3.2 Government of the Hong Kong Special Administrative Region (1999). *General Conditions of Contract for Civil Engineering Works (1999 Edition)*.
- 3.3 Government of the Hong Kong Special Administrative Region (1999). *General Conditions of Contract for Design and Build Contracts (1999 Edition)*.
- 3.4 Halcrow China Ltd (2002). *Study on the Provision of Temporary Protective Barriers and Associated Measures and Methods of and the Supervision to be Specified and Provided for Rock Breaking Operations* (prepared under Agreement No. GEO 10/98).
- 3.5 Works Branch (1997). *Independent Checking of the Design, Erection, Use and Removal of Temporary Works (Works Branch Technical Circular No. 3/97)*. Works Branch, Government Secretariat, Hong Kong.
- 3.6 Works Bureau (2001). *Designs and Alternative Designs by Tenderers (Works Bureau*

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Technical Circular No. 2/2001). Works Bureau, Government Secretariat, Hong Kong.

4. **TECHNICAL RECOMMENDATIONS**

4.1 WBTC No. 3/97, WBTC No. 2/2001 and ETWB TC (W) No. 51/2002 specify the requirements of an independent check of the Contractor's design of any permanent or temporary works. The independent check is carried out by an Independent Checking Engineer in the case of a conventional contract and by a Design Checker in the case of a Design and Build Contract.

4.2 For those rock slope excavation works with significant public safety concern in the event of failure, i.e. under the circumstances described in para. 1.1 above, the independent check of design and construction review should be enhanced. The division of responsibilities between different parties for design and construction review of rock slope excavation for a conventional contract and a Design and Build Contract are summarised in Annexes TGN14 A1 and TGN14 A2 respectively. The enhancements recommended are highlighted in bold in these Annexes and are described below. The recommended enhancements are based on the findings of a review of the current practice by Halcrow (2002).

(a) **EXPERIENCE OF THE INDEPENDENT CHECKER**

The independent checker should be a Registered Professional Engineer (Geotechnical) or equivalent with experience in rock slope excavation.

(b) **DUTIES OF THE INDEPENDENT CHECKER**

In addition to the duties of the design check in the office, the independent checker should also carry out site inspections at critical stages of construction (e.g. before and after major blasting and rock excavation, after vegetation clearance and chunam stripping, and during or after heavy rainstorms) to examine the ground conditions and compare these with the design assumptions, and examine the site inspection reports prepared by the designer. He should satisfy himself that the designer carries out site inspections at the critical stages of construction works, that all critical items of works affecting safety have been inspected and properly recorded, and that necessary changes in the design/work method are made. Proper records of site inspections should be documented.

(c) **AUDITING OF THE WORKS OF INDEPENDENT CHECKER**

The Engineer in the case of a Conventional Contract or the Supervising Officer in the case of a Design and Build Contract should ensure that the independent checker carries out his duties with reasonable skill and care. In addition to

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examining the documents submitted by the independent checker, the Engineer or the Supervising Officer may also audit the checking process as appropriate.

- 5. **ANNEXES**
- 5.1 TGN14 A1 Division of Responsibilities under a Conventional Contract for Rock Slope Excavation.
- 5.2 TGN14 A2 Division of Responsibilities under a Design and Build Contract for Rock Slope Excavation.

(R K S Chan)
Head, Geotechnical Engineering Office

**Geotechnical Engineering Office, Civil Engineering and Development Department
The Government of the Hong Kong Special Administrative Region**

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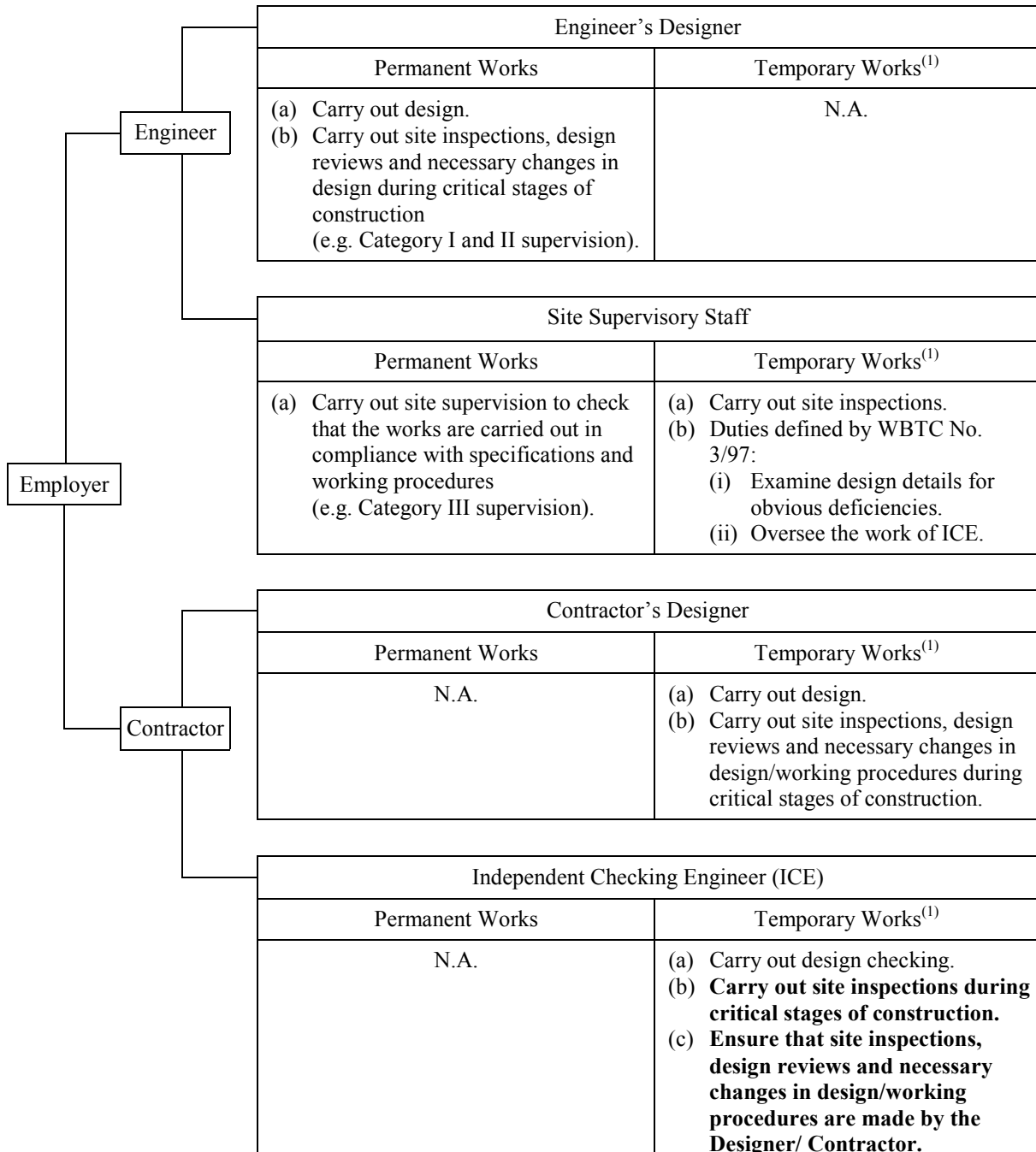
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Division of Responsibilities under a Conventional Contract for Rock Slope Excavation



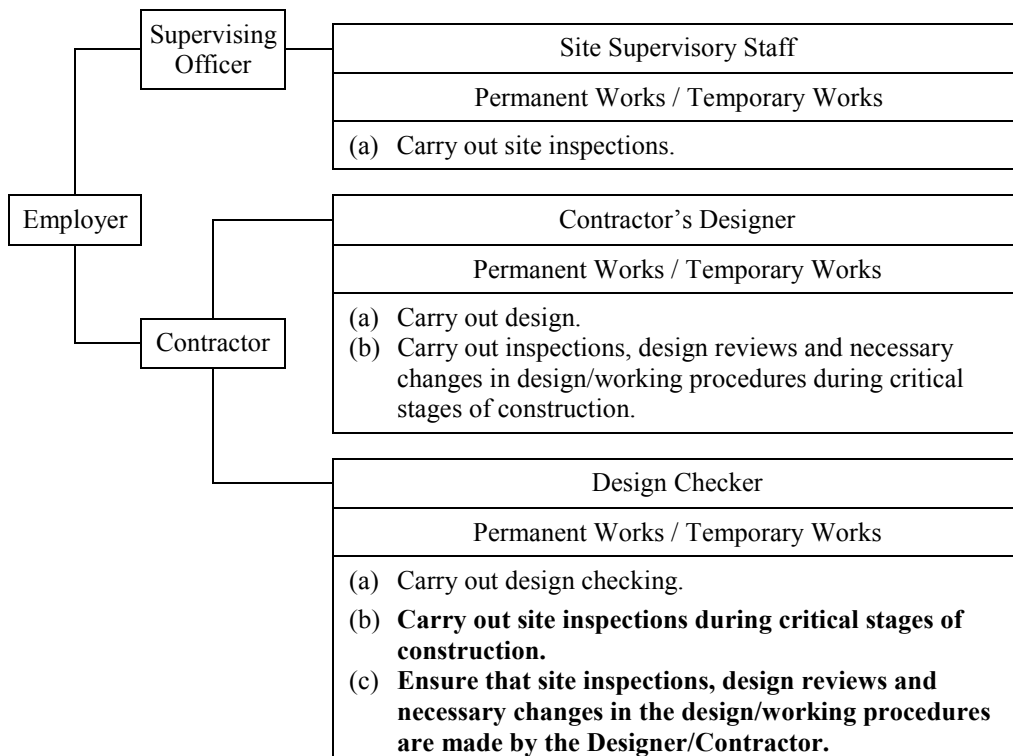
Note: (1) This also applies to alternative designs to permanent works proposed by the Contractor.

(2) Enhanced site checking duties of the Independent Checking Engineer recommended in this TGN are highlighted in **bold**.

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Division of Responsibilities under a Design and Build Contract for Rock Slope Excavation



Note: (1) Enhanced site checking duties of the Design Checker recommended in this TGN are highlighted in **bold**.