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

GEO Technical Guidance Note No. 50 (TGN 50)
Technical Requirements for Determination of Bulk Excavation Limit in the Mid-levels Scheduled Area

1. SCOPE

1.1 This Technical Guidance Note (TGN) provides guidelines on the technical requirements for the determination of bulk excavation limit in the Mid-levels Scheduled Area.

1.2 Any feedback on this TGN should be directed to Chief Geotechnical Engineer/Island of the Geotechnical Engineering Office (GEO).

2. TECHNICAL POLICY

2.1 The technical recommendations promulgated in this TGN were agreed by the Geotechnical Control Conference (GCC) of the GEO on 25.11.2020.

3. RELATED DOCUMENTS

3.1 BD (2021). *Geotechnical Control on Developments in Mid-levels Scheduled Area (PNAP APP-30)*. Buildings Department, Hong Kong.

3.2 GCO (1982). *Mid-levels Study : Report on Geology, Hydrology and Soil Properties*. Geotechnical Control Office, Hong Kong.

4. BACKGROUND

4.1 The Mid-levels Scheduled Area of Hong Kong Island, in which the Po Shan Road Landslide occurred in 1972, is characterised by its steep sloping terrain. A detailed geotechnical study was carried out by the then Geotechnical Control Office between 1979 and 1981 to examine the slope stability of the Mid-levels area (Mid-levels Study). The Mid-levels Study concluded that, in order to permit building and infrastructure developments in the Mid-levels area, special geotechnical control should be exercised to ensure overall stability of the area.

4.2 BD has recently implemented a performance-based building control system which will come into operation on 1.2.2021. Under this new system, all current prescriptive provisions under the Building Regulations will be converted into performance-based ones as far as practical. In line with the new system, this TGN sets out the performance-based provisions for determination of bulk excavation limits in the Mid-Levels Scheduled Area. The main objective is to minimise cumulative adverse effect of bulk excavation and any other works, which could lead to an excessive reduction to the support of the hillside, both during construction and in the long term, thereby affecting the overall stability of the area.

4.3 Geotechnical control requirements on private developments in the Mid-levels Scheduled Area are stipulated in PNAP APP-30 (BD, 2021). The extent of the Mid-levels Scheduled Area is shown in Figure 1.

4.4 Under the legislation, bulk excavation in the Mid-levels Scheduled Area should be limited to a level so as to minimise the cumulative adverse effect to the area, which is defined as the bulk excavation limit. The technical requirements for the determination of bulk excavation limit are given in Section 5.1, which are based on the recommendations of the Mid-levels Study and have been adopted by the GEO since 1982. The bulk excavation limit so determined has been proved to be effective for the purpose of geotechnical control.

5 TECHNICAL RECOMMENDATIONS

5.1 Technical Requirements for the Determination of Bulk Excavation Limit

5.1.1 For determining the bulk excavation limit, the Mid-levels Scheduled Area is divided into Zones I, II and III, together with a 30 m Transition Zone between Zone III and Zone I, in terms of overall hillside stability, as shown in Figure 2. The maximum depth of bulk excavation permitted in each Zone, in terms of bulk excavation limit, should be determined using Table 1.

5.1.2 The pre-development topography (i.e. natural topography of the Mid-levels Scheduled Area before commencement of any development works) of the site should be assessed based on the following and other relevant information:

- tentative bulk excavation limit as provided by the GEO
- site-specific ground investigation data
- topographic survey data as per the technical requirements given in Section 5.2

5.1.3 The assessment of bulk excavation limit should also take into consideration the determined bulk excavation limits of other sites in the vicinity, where available, which can be obtained from the Digital Geotechnical Information Unit website (https://www.ginfo.cedd.gov.hk/dgiu).

5.2 Technical Requirements for Topographic Survey

5.2.1 Topographic survey should be carried out for producing survey plans with sufficient cross-sections showing ground levels at the site and in its immediate vicinity. The sections should be extended and detailed to a distance of at least 30 m beyond the boundaries of the site. The survey plan and sections should be plotted at a scale of 1:200 and other scales as required by BD/GEO upon request. The survey should be based on control points and bench marks of the Survey and Mapping Office of the Lands Department. The Hong Kong Territorial Grid should be superimposed on the survey plan.

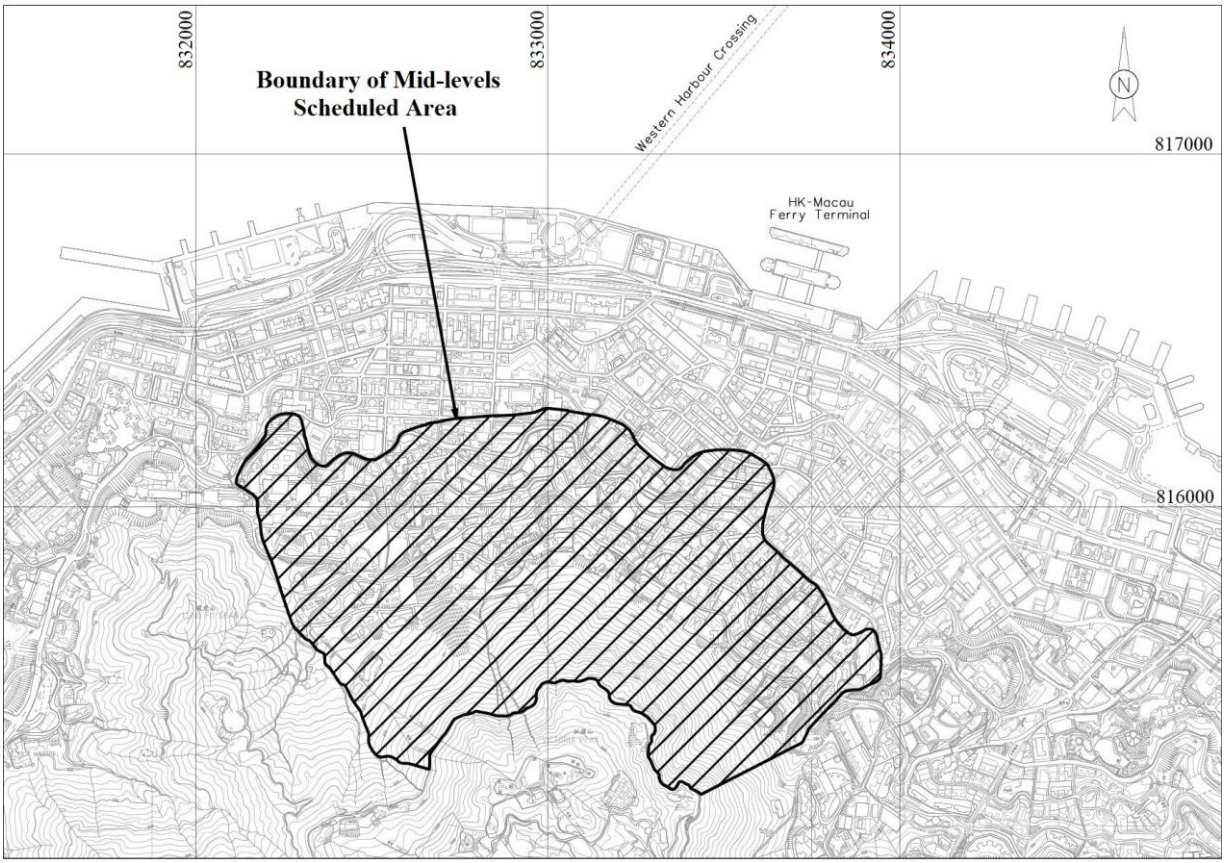
5.2.2 Spot levels should be taken on all salient ground features, the positions of which should be fixed and labelled in plan. These features may include such items as retaining walls, boreholes, drainage channels, catchpits, roadside kerbs, steps and any permanent structures. Chunam, sprayed concrete or similar uniform gradient man-made slopes need not be contoured provided that spot levels are indicated at the top and bottom of the slope and spot levels are taken at not greater than 5 m intervals in plan on the slope.

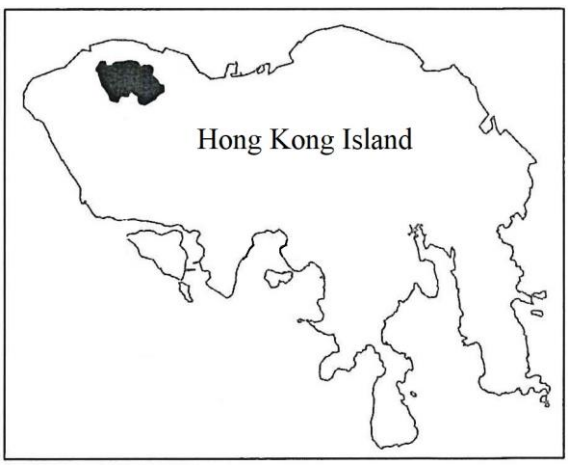
5.2.3 The cross-sections to be taken should be surveyed independently of the plan survey and should have levels taken at all changes in gradient. Notes should be made of any features cut by the sections. The position of the sections should be selected as to follow more or less the line of maximum gradient across the site and to adequately illustrate variations of ground conditions between sections. The positions of sections shown on the final plan should be plotted from survey measurements made to fix the sections. A sufficient number of sections should be taken across the site to give complete coverage of the ground. Typically a 20-30 m spacing between sections is adequate although this may be increased depending on the size of the site. For small sites a minimum number of two sections will be required.

(W M Cheung)
Head, Geotechnical Engineering Office

GEO Technical Guidance Note No. 50 (TGN 50)
Technical Requirements for Determination of Bulk Excavation Limit in the Mid-levels Scheduled Area

Figure 1 – Extent of the Mid-levels Scheduled Area





GEO Technical Guidance Note No. 50 (TGN 50)
Technical Requirements for Determination of Bulk Excavation Limit in the Mid-levels Scheduled Area

Figure 2 – Zoning within the Mid-levels Scheduled Area

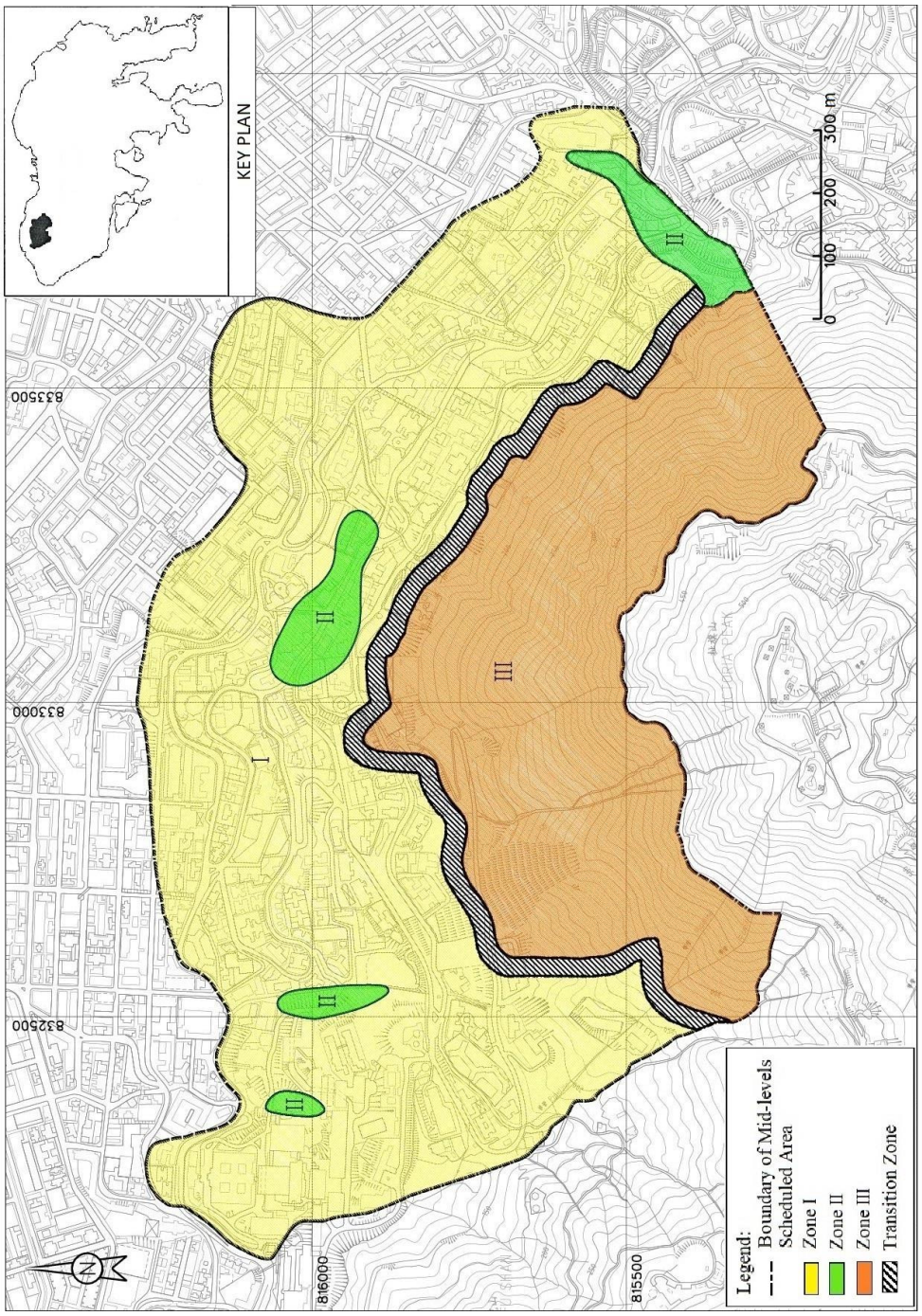


Table 1 – Bulk Excavation Limit in Zones I, II and III and Transition Zone

Zone	Bulk Excavation Limit
Zone I	7.5 m below the pre-development topography (see Note 1).
Zone II	No bulk excavation generally (however, bulk excavation up to a maximum of 7.5 m below the pre-development topography may be carried out where this improves the local slope stability).
Zone III	No bulk excavation.
30 m Transition Zone between Zone III and Zone I	No bulk excavation at the boundary of Zone III and Transition Zone, increasing gradually to 7.5 m below the pre-development topography at the boundary of Zone I and Transition Zone.

Note 1 - Pre-development topography is the natural topography of the Mid-levels Scheduled Area before commencement of any development works.