



安全、綠化、悅目的中大斜坡

Safe, Green and Beautiful – Slopes of the Chinese University

Torrential rain lashed Hong Kong in the month of June, and the Hong Kong Observatory issued rainstorm and landslide warnings. But despite the downpour, no landslide was registered at the Chinese University, save a couple of wash-outs. For a campus with some 300 registered slopes and a large number of natural slopes, this was no easy feat. Weeks later, the skies cleared and the slopes turned a luxuriant green. This, too, was no easy feat. Safe and beautiful slopes are the result of constant vigilance and meticulous efforts at slope improvement.

Safety and More

In 1997, weeks of heavy rain triggered major landslides on our campus. But the number started steadily decreasing shortly after that. By 2000, there were very few large-scale slippages even during the rainy season. The trend owed itself to the policies of the Standing Committee on Campus Geotechnical Matters, set up in 1998, their implementation by the Campus Development Office and the Estates Management Office. For these administrators and professionals, safety was important but something more had to be done.

Landscaping Treatment after Slope Works

Landscaping treatment on stabilized slopes falls roughly into two categories—hard surface and soil surface. Hard surface

六月份，暴雨襲港。香港天文台發出暴雨及山泥傾瀉警告。儘管大雨滂沱，除了一兩宗泥土沖蝕，中大並無錄得山泥傾瀉。對於一個有三百幅登記斜坡及大量天然斜坡的校園來說，這樣的成績實在得來不易。數周後，天色轉晴，斜坡已變得茂綠。這當然也是得來不易的。斜坡既安全又悅目，是經年累月監察與悉心改善的成果。

安全

1997年，連綿數周的豪雨，導致校園出現幾處嚴重的山泥傾瀉。但自

slopes include slopes sprayed with concrete, rock outcrops and retaining structures. In the 90s, shotcreting (projecting concrete through a hose onto a surface) was the dominant method of surface protection after slope stabilization in Hong Kong. Quick, cheap and effective, it was widely used by the Government. But the shotcrete nozzle is a Vesuvius that mummifies everything within its radius with a layer of white lava. Shotcreted hillsides look lifeless and incoherent. So while the technique was still used to treat dangerous slopes and as an emergency measure, the University shifted its focus to methods that would bring more aesthetically pleasing results.

Cosmetic Approaches

Over the years, the University has adopted an array of techniques to mitigate the visual impact of engineering works and maximize opportunities for

此之後，山泥傾瀉的次數漸減。直至2000年，即使是雨季，也只有極少數的大規模滑移。這個當歸功於在1998年成立的校園岩土事務委員會的政策，以及校園發展處和物業管理處的努力。對於這些行政人員和專業人士來說，安全是重要的，但仍須努力。

斜坡工程後的景觀處理

斜坡鞏固後，在景觀處理上大致可分為兩類—硬面和泥面。硬面處理的斜坡包括噴凝土（透過軟管把凝土噴在坡面上）、岩床及擋土牆。九十年代的香港，在鞏固斜坡後，噴凝土是保護表面的主要方法。由於快速、便宜及有效，這種方法獲政府廣泛使用。不過，噴凝土機的噴嘴就有如一座火山，噴出白色的岩漿，覆蓋四周。經處理後的山坡了無生氣，與原有環境欠缺協調。這種技術雖至今仍沿作處理危險斜坡的緊急

vegetation planting on slopes.

Examples include the planting of ornamental shrubs and climbers on slopes and retaining walls, the use of earth-toned masonry facing, and adoption of advanced greening technologies such as mulching.

Protection of Trees

Contrary to common belief, trees do not necessarily have to be removed during slope improvement works. At the University campus, for instance, soil nailing is used to stabilize cut-slopes in order to reduce disturbance to trees, and where the slope surface has to be regraded, tree rings and toe walls are sometimes used to retain trees. Sometimes trench excavation, a more time-consuming and partially manual method of

措施，大學已逐漸傾向採用其他方法，使效果更賞心悅目。

美化方法

多年來，大學採用各種技術，美化岩土工程的視覺效果，並盡量在斜坡上種植。例子包括在斜坡和擋土牆種植裝飾用的灌木和攀緣植物、使用褐土色石面，並採用諸如覆草法的先進綠化技術。

保護樹木

一般以為進行斜坡改善工程一定要移走樹木，其實不然。舉例說，中大校園便利用泥釘穩定削土坡，減少干擾樹木。至於需重整的斜坡表面，則有時用樹穴和坡腳牆來保留樹木。另一個方法是藉挖坑來穩定鬆散的回填坡，盡量減少移植樹木。耗時較長，部分工序需用人手處理。

斜坡維修須持續不斷。天然的斜坡要變得安全，「安全」的斜坡必須密切監察和保養。當然，並非所有綠化的斜坡都像伊甸園般茂盛，至少不會是四時皆綠。校園發展處的土力工程師馬維德表示：「植被的狀態亦取決於生長的環境。但在模仿自然的技巧上，大學做得非常出色。」駕車往大學門外的大埔道，足可見此言非虛。

stabilization is used to stabilize loose fill-slopes in order to minimize the need for tree removal.

Slope improvement is an ongoing process. Untreated slopes have to be made safe while stabilized slopes have to be closely monitored and maintained. Admittedly though not all greened slopes resemble the Garden of Eden in bloom, at least not all the time. 'The state of the vegetation depends also on the conditions for growth. But given that this is science trying to mimic nature, the University has fared very well,' said Mr. Arthur Ma, geotechnical engineer in the Campus Development Office. A drive down Taipo Road outside our gates would tell you that. ✨



往聯合書院沿路的一道石面斜坡，現在長滿了綠葉
A rock surface slope on the road to United College now teems with green



在邵逸夫人樓附近的回填坡，是藉挖坑種植來鞏固的。這種方法可盡量減少移植樹木，部分過程須用人手處理，耗時較長。
A more time-consuming method of stabilization—trench excavation—was used to stabilize this fill-slope near the Lady Shaw Building so tree removal can be minimized. Part of the procedure was carried out manually.



九十年代在崇基職員宿舍附近蓋滿灰泥護面的斜坡（上圖）；同一斜坡的現貌（下圖）。
Before: a slope covered with chunam plaster near Chung Chi staff quarters in the 1990s (top)
After: the same slope now (above)