

# Planning & Construction of Temp Works for Emergency Slope Works at Sai Wan Road

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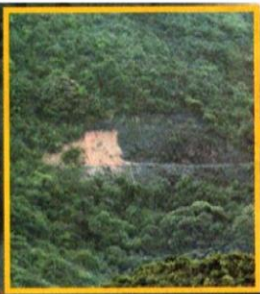
- **Background**
- **Scope of works**
- **Challenges**
- **Planning**
- **Working Sequence**
- **Monitoring and Safety Measures**



Background

- Contract No. GE/2013/29 – Term Contract in LPMit Programme
- Contract Sum Approx. HK\$110M in 30 months
- The Engineer – LPM3 Division, GEO, CEDD
- Main Contractor – Geotech Engineering Ltd.

# 暴雨 塌泥



■西貢西灣村有山泥傾瀉。(戴展邦攝)

## 西灣村斷橋困12人

### 直升機成功搶險 村長：半座山秣咗！

水患  
處處

黃雨襲港四小時，西貢發生塌泥斷橋「封村」事故，十二人被困！本港昨凌晨受暴雨襲擊，天文台發出黃雨警告至清晨才「落波」，歷時四粒鐘。期間，西貢更是重災區，在西灣村發生山泥傾瀉及洪水沖毀橋樑，堵塞進出村路，九名入村露營學生及三名村民被困，消防及飛行服務隊趕至救援，消防員曾用生命探測器搜索，證實無人被山泥活埋。村長形容：「半座山秣咗！」幸有驚無險。



■直升機救走露營人士。

昨凌晨一時五十五分，天文台發出黃色暴雨警告信號，並於清晨六時十五分「落波」。另外，於凌晨五時十分至上午七時四十分期間，亦發出新界北部水浸特別報告。期間，多處地區錄得超過七十毫米雨量，新界北部錄得超過一百毫米，西貢雨量更超過二百毫米。根據相關部門資料，昨日黃雨及水浸特別報告期間，共接獲三宗塌樹、四宗水浸及兩宗山泥傾瀉報告。

#### 兩批學生擬露營兩晚

發生塌泥現場為西貢西灣村，前晚兩批分別為五名中三男學生，以及三男一女兩亞學生，前往村內附近露營，他們原定露營兩晚，於入夜後，天氣轉趨惡劣，暴雨愈落愈大。至昨晨八時許，兩批學生決定收拾行李趕快出村，並向村長黎恩借水梳洗後，便匆匆起行。並料，步至西灣路時，赫然附近山坡有大幅山泥倒塌，堵塞出入西灣村通道，眾人折返向村長求救，黎教他們循鹹田方向離開，但再發現過河橋樑亦被洪水沖毀，無路可走，九名學生連同黎和兩名村民，無計可施下報警求救。

警方趕至西灣路及萬宜路交界處封路，禁止市民接近，連同消防員徒步入村，確認十二人安全。期間，在封鎖線三公里外，發現山泥傾瀉現場，坍塌面積約八米乘八米，消防員恐有人被活埋，遂出動生命探測器搜索，以及將擋路山泥移開，證實無人被埋。

#### 七旬村民堅守待水退

期間，於上午九時許，飛行服務隊人員奉召到場，以直升機先後兩次將被困人士救離現場，其中一名七十餘歲村民堅守留守村內，待退水始離去。其餘十一人由直升機送至萬宜水庫西端降落，幸無人受傷，眾人自行離去。土木工程拓展署派員到場視察及跟進，工人在場清理泥頭。

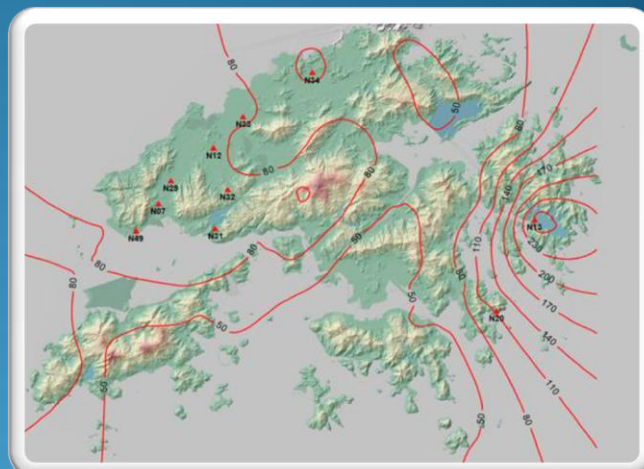
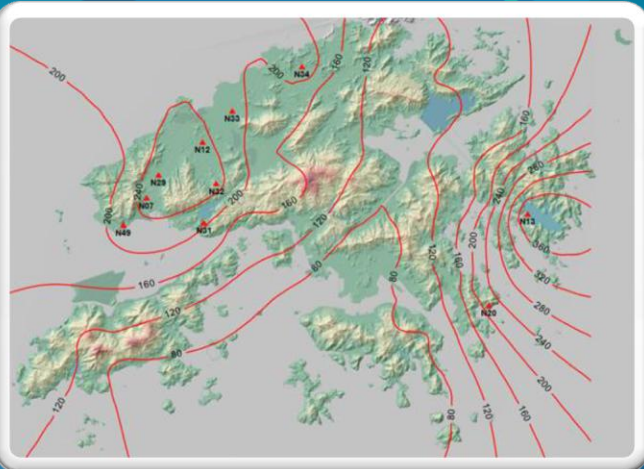
黎村長表示，西灣村村民大多已搬出市區，每逢周末及假期才會返村留宿，前晚開始因天氣惡劣，村民沒有回來，否則會有更多人被困。他指稱，昨日塌下的山泥面積有「半座山咁高」，形容是「半座山秣咗！」而被沖毀的橋樑名叫「夾馬坑橋」，廿多年前建成，長約廿米，為通往鹹田灣唯

一道路，現有待維修。黎又稱，大雨過後村內斷水，幸仍有電力供應。

土木工程拓展署表示，受前晚至昨晨大雨影響，西貢西灣路近西灣亭及麥理浩徑近赤徑一帶的天然山坡發生多宗山泥傾瀉，部分路段需臨時封閉。同時，麥理浩徑第二段標距柱M042近赤徑碼頭附近已被山泥堵塞，行山人士和居民應暫時避免前往該處。該署和相關部門正進行緊急斜坡工程。



■消防用生命探測儀器搜救。



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21 May 2016



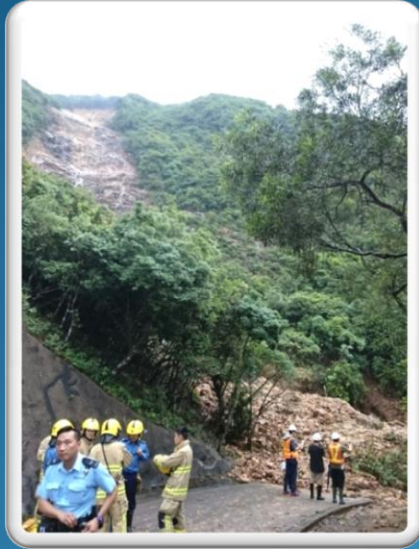




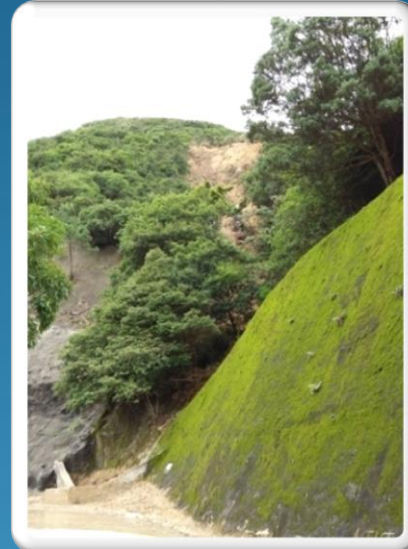


**Landslide volume approx. 2100 m<sup>3</sup>, equivalent to that of 1 standard swimming pool**

**SW 1**



**SW 2**





# Scope of Works

## Typical flexible barrier



Install 3 layers of flexible barriers (FB01, FB02 & FB03) at SW1

Install 1 layer of flexible barrier (FB04) at SW2

Within 3 months construction time



# Challenges

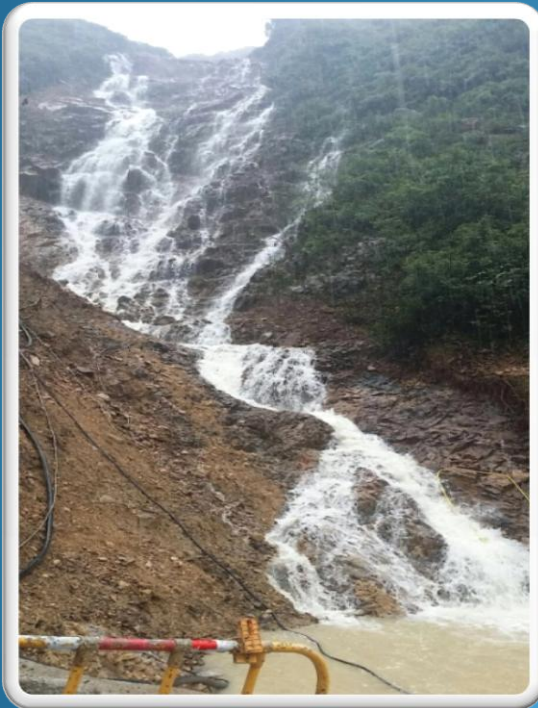


- Working at height (above 40m) and average over 45 degree inclination
- Fast track construction
- Adverse weather
- Risk of further landslide
- Heavy surface runoff



1	T
3	L

8	西北 NW	▲
8	西南 SW	▼



# Planning

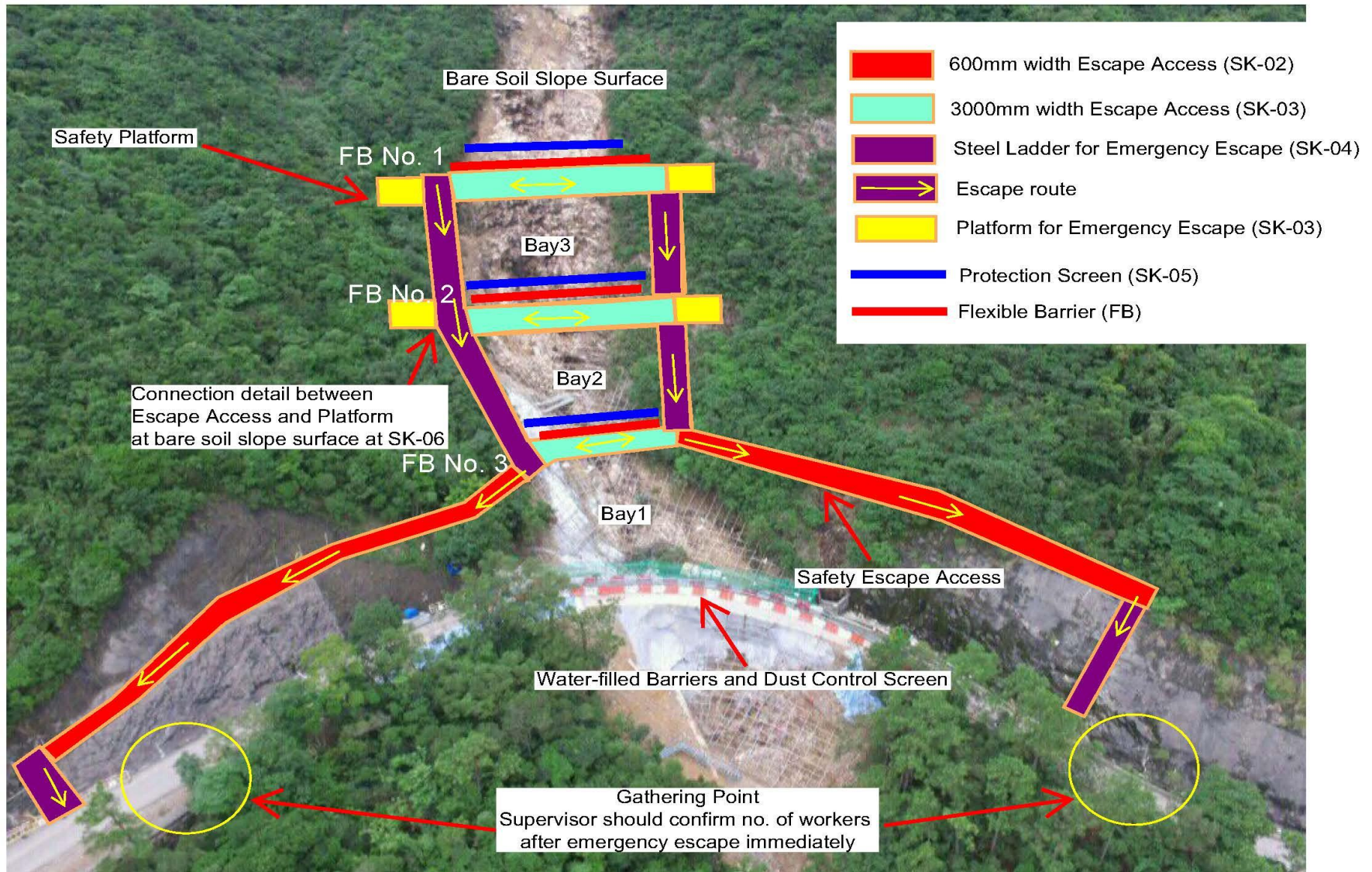


# General View of the Site





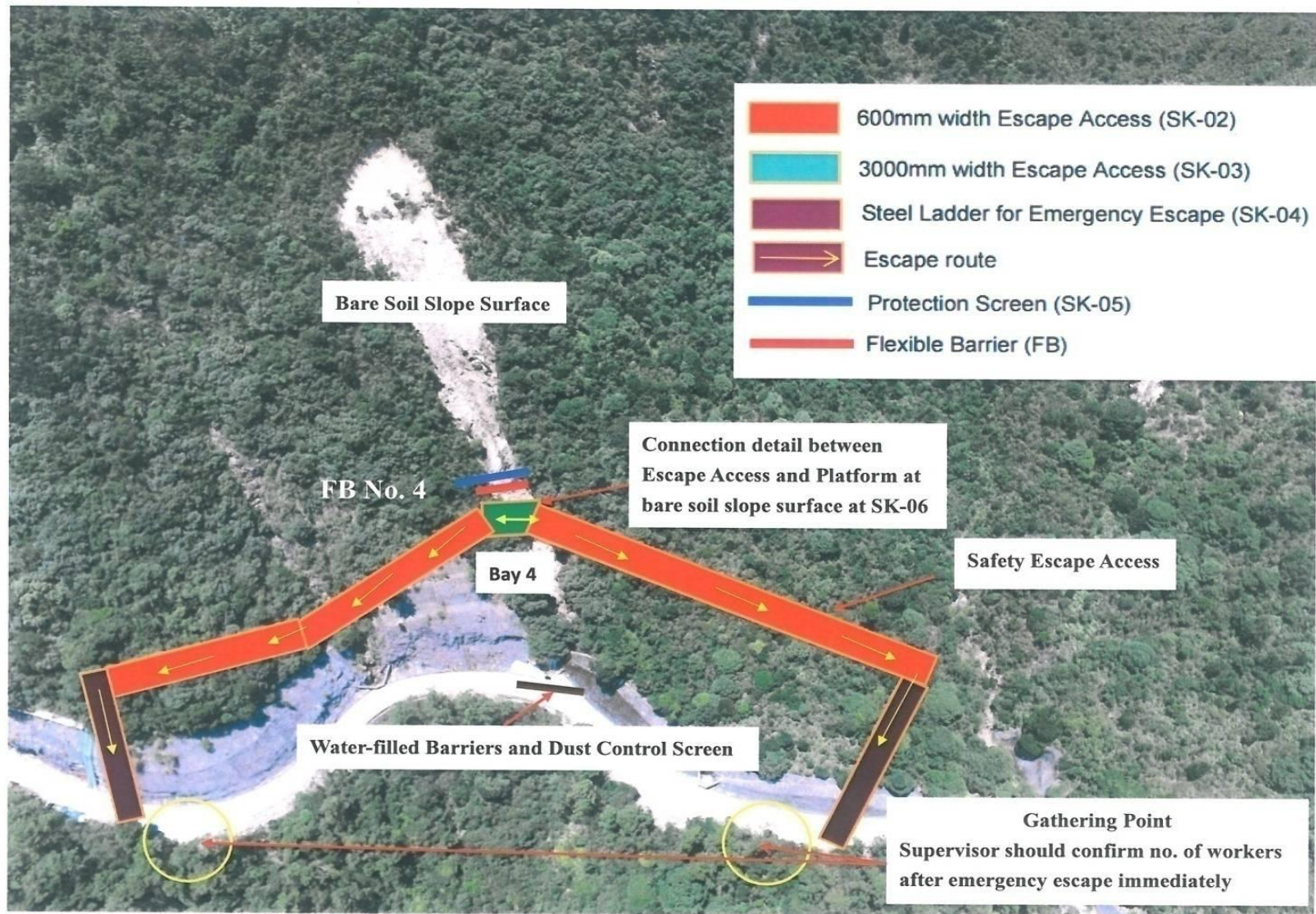
# Emergency Escape Plan for SW1



Sketch No. SK-01



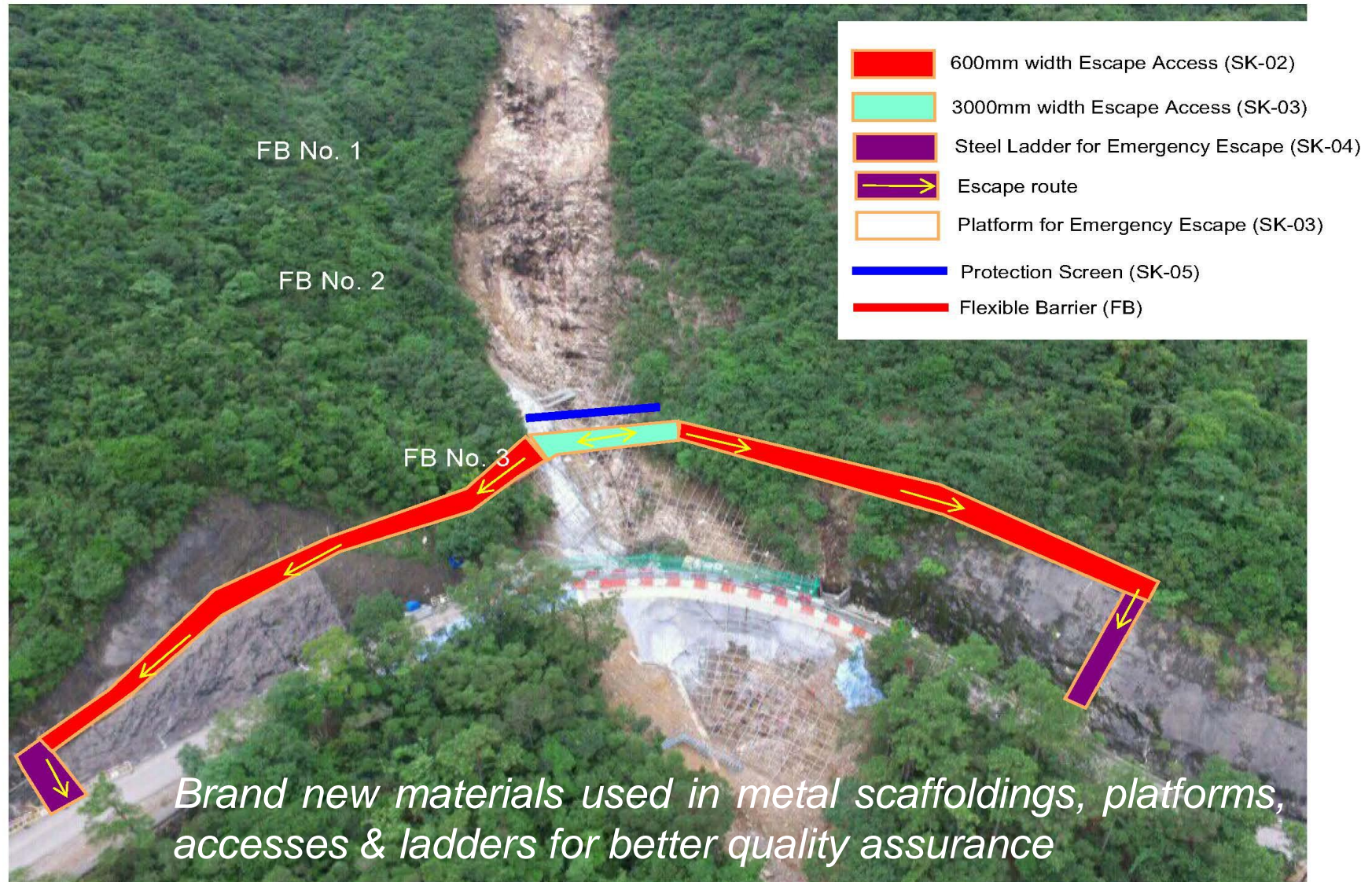
# Emergency Escape Plan for SW2



# Working Sequence



# Starting from erection of escape access, platform and temporary protective screen at the lowest layer





# Move to second layer



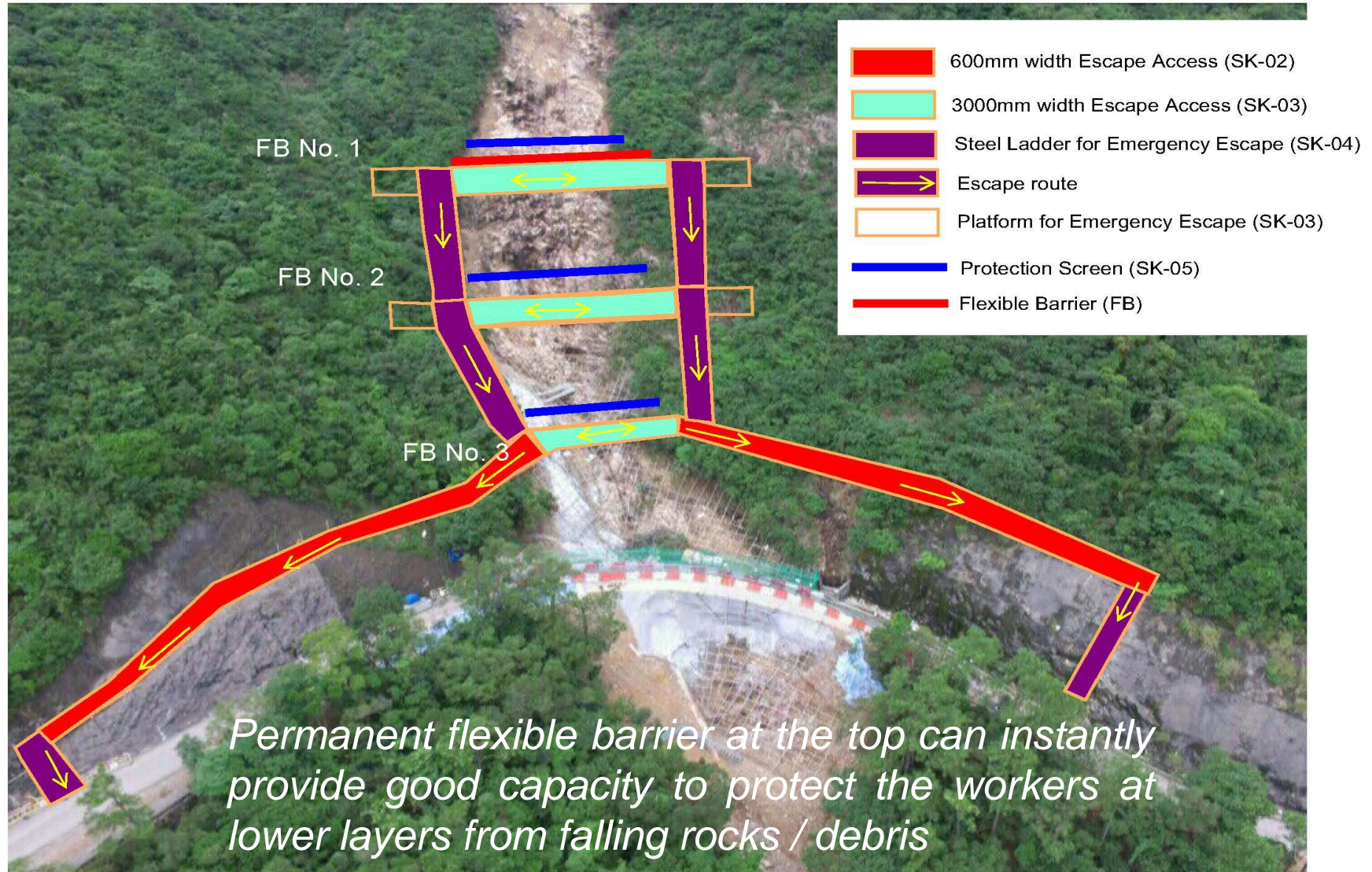


# Finally reach the highest layer





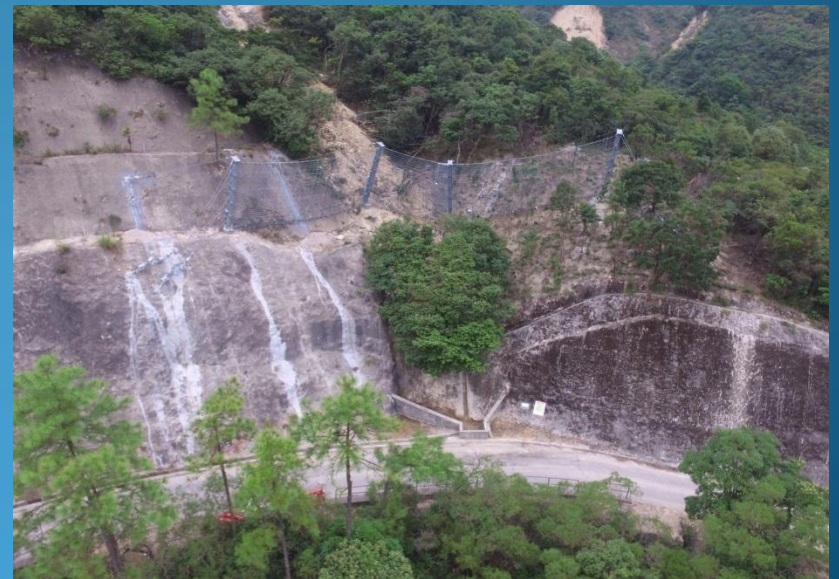
All escape accesses, platforms & temp protective screens completed. Then construct flexible barrier at the highest layer



# Monitoring and Safety Measures



Use drone to take aerial photos to monitor the situations of the scars daily and right after adverse weather





# Weekly emergency drill and training



# Actions in Inclement Weather

## Tropical Cyclone Warning

Typhoon Signal No.8 or above is issued	Site Close
Typhoon Signal No.3 or below	Site Open

## Rainstorm Warning

Black Rainstorm Warning is issued before working hour (08:00-18:00)	Site Close
Black Rainstorm Warning is issued during working hour (08:00-18:00)	Stand By on Site (worker should be stayed in a resting place)
Red or Yellow Rainstorm Warning	Ditto
Normal Raining	Ditto
Thunderstorm Warning	Ditto



Lightning  
Detector



# Heat stroke prevention





# Caring measures



Blower



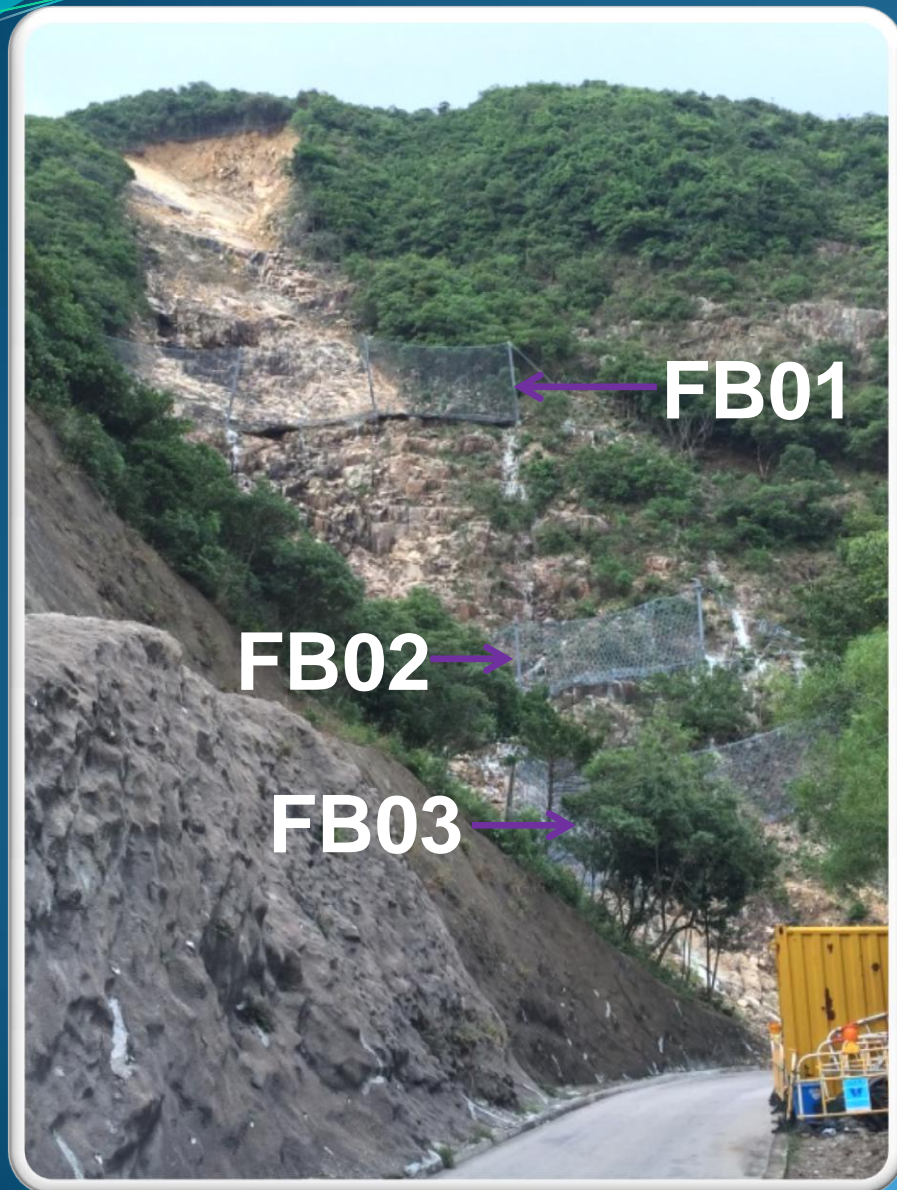
Sphygmometer



Sprinkle system



# Successful completion within 3 months





A group of approximately 20 construction workers, wearing hard hats and safety vests, are standing on a newly constructed bridge deck. The bridge is supported by a complex network of steel scaffolding and is situated over a deep, rocky gorge. In the background, a steep, rocky hillside rises, partially covered with green vegetation. A safety net is visible above the workers.

# Thank you

*Courtesy to CEDD for sharing the photos*