

ARCHITECTURAL SERVICES DEPARTMENT

SMART SITE SAFETY

Redevelopment of Queen Mary Hospital, Phase 1





OUTLINE OF TOPICS

WHAT WE'LL DISCUSS

- Project Overview of QMH Redevelopment
- Why Smart Site?
- ArchSD Smart Site Safety Initiatives
- Risk Orientated Safety Management

QUEEN MARY HOSPITAL

REDEVELOPMENT PROJECT

The redevelopment project includes demolition of three buildings at QMH's northern site for the following works:

- Formation of a new **vehicular access** route connecting PFL Road to QMH's main deck;
- Cutting the **rock slope** to form the Site;
- Construction of a New Block with 32 storeys of **different clinical / functional uses** in a very limited site area;
- Providing a **rooftop helipad** for medical emergency purposes



CHALLENGES

HOSPITAL OPERATIONS

Block K, containing major clinical departments of QMH and operating theatres, is in close proximity to the Site that their normal operation / services must not be affected by the construction works.

CONSTRUCTION NUSIANCE

Environmental impacts including vibration, noise, dust, etc. are to be controlled under very stringent requirements and closely monitored to minimize the nuisance to hospital users.

TRAFFIC / ACCESS LIMIT

Construction vehicles are limited to access the Site direct from Pokfulam Road only. Together with the very limited site area, site logistics arrangement and handling of materials delivery are particularly difficult in this Site.

EXISTING SERVICES

Existing stormwater drains discharging water from the hillside and a Pokfulam water conduit run across the Site that need to be diverted and maintained during the contract period.

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INTERESTING FIGURES OF NEW BLOCK

32 storeys

23 G/F level from PFL Road (metre)

161 building height (metre)

13.2 plot ratio (approx.)

8,300 site area (approx. in square metre)

143,000 construction floor area
(approx. in square metre)



WHAT WE HAVE DONE?

DEMOLITION

Nuisance-free demolition of three buildings and two link bridges connecting with the existing Block K without causing disruption to hospital's operation / services ; **zero accident** recorded in the period



SITE FORMATION

Adopted appropriate construction methods to complete extensive excavation and slope stabilisation **without exceeding the control limits** to safeguard the hospital's operation / services ; **zero accident** recorded in the period



DIVERSION

Diverted the existing storm water drainage pipes collecting rain water from hillside and portion of Pokfulam conduit within Site; **maintained proper functioning** of these existing services without causing disruption



WHAT'S NOW?

SUPERSTRUCTURE

Superstructure works are in progress and completed up to G/F (hospital main deck level) now. Finishing works, building services installation, interior fit-out, curtain wall installation, and more work trades are to be commenced in due course.



WHY SMART SITE?

A NECESSITY

CHALLENGE

Malpractices or misbehaviours are not easily spotted during site supervision in particular to **high-rise building site** involving **labour intensive** works of different trades in a **congested site**

PREVENTIVE ALERT

To issue **warning alerts** to workers, supervisors and safety management staff in case of encountering potentially dangerous circumstances for the sake of **taking prompt actions**

SAFETY PERFORMANCE

To adopt innovative technologies and smart devices to improve overall **safety performance** and further **strengthen supervision** on construction site in respect of site safety

SMART SITE SAFETY

ArchSD INITIATIVES



SITE SAFETY
MANAGEMENT



SITE SAFETY
TRAINING



ACCESS
CONTROL



UNSAFE ACTS /
CONDITIONS ALERT



ENVIRONMENT
& HYGIENE

PILOT ADOPTION EXAMPLES



SITE SAFETY MANAGEMENT

Wireless network, centralized management platform, digital permit-to-work system, equipment tracking



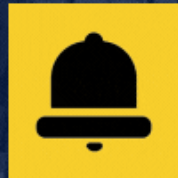
SITE SAFETY TRAINING

Virtual Realty (VR) / Mixed Realty (MR) training to workers & frontline supervisors on high risk activities



ACCESS CONTROL

Personnel access control to lift well, floor opening, electric box, confined space



UNSAFE ACTS / CONDITIONS ALERT

Tower crane lifting zone warning system, mobile plant in operation warning system, improper use of safety harness



ENVIRONMENTAL & HYGIENE

Reverse vending machine, food waste machine, 12V DC LED strap lights, bio-chemical toilet

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PILOT PROJECT



WORKING GROUP MEETINGS

DEVB, ArchSD and the Contractor form a WG and meet regularly to monitor / review the status



INNOC FOCUS GROUP

ArchSD's InnoC Focus Group facilitates sharing of ideas and support innovation in construction



NETWORK-CONNECTED SITE

Wireless network with full-coverage Wi-Fi , LoRa gateways, cloud-based platform, etc.



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RISK ORIENTATED SAFETY MANAGEMENT

RISK

Digital platform to assist site personnel to realize project-specific risks in **planning stage** and manage the **safe working procedures** to avoid unauthorized site activities

TRAINING

Hazards realization in task-specific training to enhance **safety awareness** and understanding of safe working procedures; training materials distributed by **e-learning platform** and **mobile app**

INSPECTION

Safety inspection **checklist auto-generated** from digital platform with pre-established frequency; and **monitoring** of inspection progress via **mobile app** and **control centre**

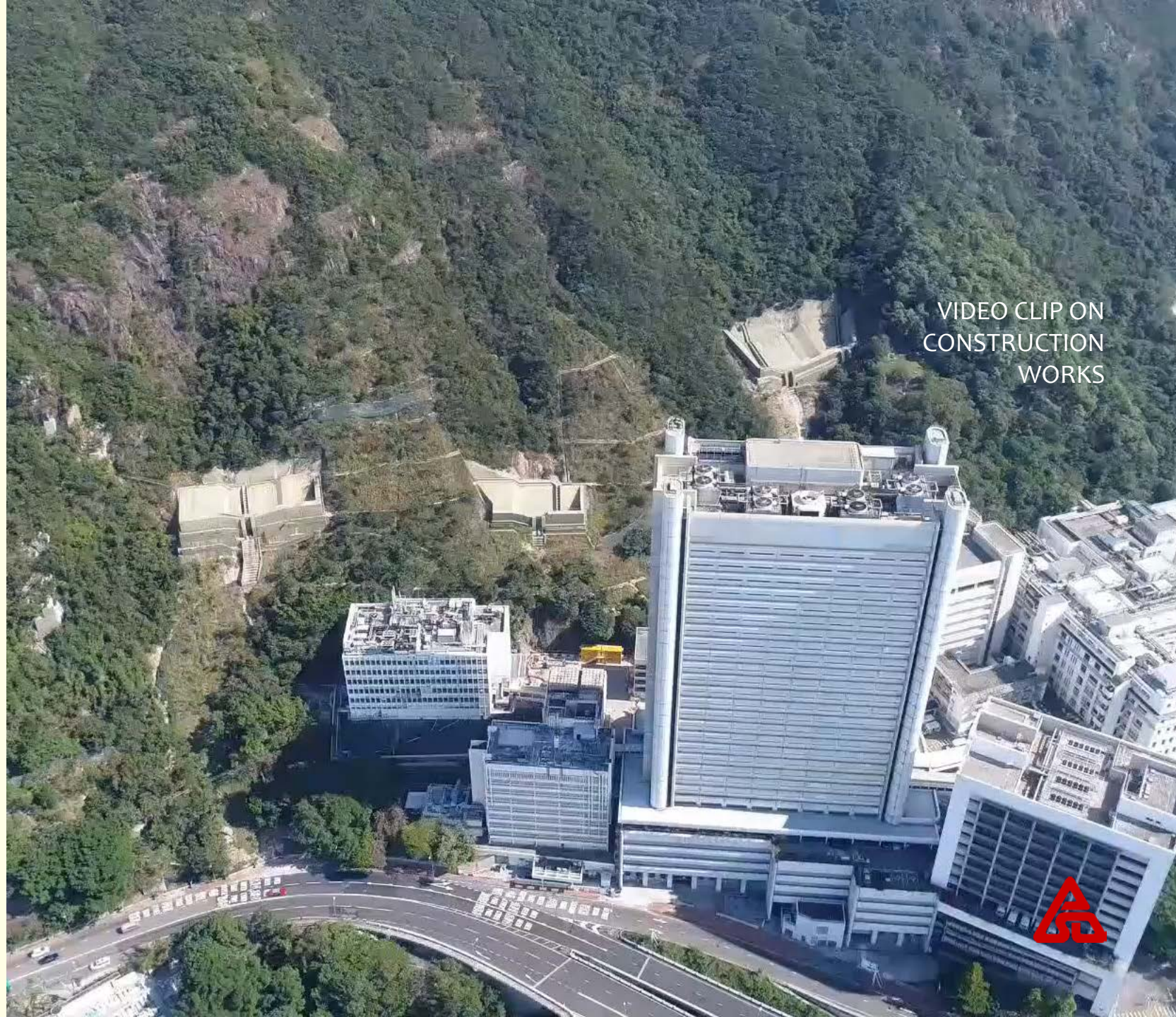
ALERT

Real-time positioning system to monitor and manage danger zones, enables **instant alert** and **collaborative response** to enhance communication / awareness before the risk is eliminated

COLLABORATION

MAKING THIS SMART SITE POSSIBLE

Details on site implementation and adoption of smart devices are to be presented by our partner Paul Y. - ABLE Joint Venture



VIDEO CLIP ON
CONSTRUCTION
WORKS