Construction Safety
- common hazardous environment encountered in building and civil work sites  (Part 1)

Presentation material for
Seminar organized by the
Institute of Safety & Health Practitioners (ISHP)
5 June 2018

Objective of providing this seminar
- Allow audience to have a deeper understanding about the complex nature of construction sites.
- Identify the nature of hazardous environment due to the complexity of site operations.
- Develop an actual impression from real cases using photo images about various kind of hazardous environment in sites.
- Trigger thinking based on the case examples about the background, causes and possible outcomes from these site environment.

Special characteristic exists in construction sites that are unfavourable to ensure safety
1. Highly diversified nature of construction works (say from very rough work such as concreting to very fine work such as internal fittings)
2. High turnover of short-term labours
3. Diversified workers in various trades and specialization
4. A great number of working frontage exist especially in site with very large construction area
5. Often required to work at high level

Special characteristic exists in construction sites that are unfavourable to ensure safety
5. Often required to work under very poor conditions (e.g. damp and wet, confined space, without access, poor lighting, poor ventilation)
6. Temporary nature of site work & facility provisions
7. Workers often required to handle some very heavy or bulky materials
8. Existence of numerous hazardous work spots such as ditches, earthworks, work at building exterior, poorly maintained services, using of mechanical plants
Common hazards often encountered in construction

1. Working with cement and asbestos
2. Difficult access to work
3. Excavation works
4. Slope work and Working with earth
5. Temporary works, including formwork and scaffold
6. Operating/Working with crane and hoists
7. General building works and erection
8. Handling of powered tools, plant and machinery
9. Working with electricity
10. Manual handling of materials
11. Demolition works
12. Possible fire hazards
13. Working in noisy, dusty, fummy or polluted environment
14. Working at height
15. Working at confined space
16. Working with pressurized equipment
17. Working on servicing roadway
18. Working over water/marine environment

Working in very confined sites

Examples of very large and complicated site with countless hazardous work locations
Examples of very large and complicated site with countless hazardous work locations
Examples of very large and complicated site with countless hazardous work locations

Examples of very large and complicated site with countless hazardous work locations

Examples of very large and complicated site with countless hazardous work locations

How many construction activities are working here?
Complicated construction layout often makes work more difficult & dangerous.
Complicated construction layout often makes work more difficult and dangerous.

Large-size building structure involved countless construction jointing as part of its work planning/phasing arrangement.
Further example of site situations with very complicated construction layout and site arrangement – Mong Kong URA’s redevelopment project (Langham Place)

Further example of very complicated site layout arrangement – Construction of the MTR Tiu Keng Leng Station

Very complicated excavation jobs involving difficult temporary traffic arrangement or access provision
Another example of very difficult site with complicated work environment – construction of the West Rail Mei Foo Station

Innovative construction method sometimes also creates construction difficulties and safety concerns

Isolated shaft/core structure creates access problem

A vertical shaft within the core wall of a building during the construction period
Working at high level

Erecting structural steel building frame at extremely high altitude

Working at high level
Working at high level

Handling of very heavy and bulky materials or components

Complicated building frame with open space and high headroom spaces within the building interior
Construction site carrying out foundation and site formation works

Complicated excavation process near live traffic

Basement construction using bottom-up arrangement
Basement construction using mix approach – Mong Kok Langham Place

Working with extremely complicated basement layout

Working with basement using top-down arrangement

Working with basement using top-down and double-bit arrangement
Using traditional timber formwork for large-sized building

Formwork arrangement for large-sized building – Festival Walk

Formwork arrangement for large building – Terminal Building of the Airport at Chek Lap Kok
Working with manual-type formwork

Work at high level - Handling of formwork

Building projects involving complicated slope and site formation works, Festival Walk, Kowloon Tong

Building projects involving complicated slope and site formation works, The Belcher’s, Island West
Building projects involving complicated slope and site formation works, City University Campus Extension Phase II project

Building projects involving complicated slope and site formation works, the Celestial at Ho ManTin/Kowloon City

Large-panel steel form used to construct an isolated core
Work platform at high level

One platform collapsed during the construction of the pier head in 1996.

Special layout arrangement to deliver heavy and bulky materials/components.

Installation of escalators inside huge interior space.
Working with structural steel erection, (Cheung Kong Center)

Demolition of building with large building area

Demolition works within congested urban environment
Serious accident causing the building completely collapsed during the demolition process – Yau Tong Case in November 2001

Yau Tong Case – Remains of part of the structure after the collapse

Congested site working environment with very limited working space

Yau Tong Case – The accommodation of large amount of debris above the floor impose great loads to the structure
Congested site working environment with very limited working space

Handling of building materials and heavy equipment

Difficult access into working spot

Stacking of material on the working deck
Working with bamboo scaffold

Limited work space that cause material storage difficulty

Messy interior before the removal of formwork materials
Further examples of messy interior
Dangerous lift shaft

Power supply and dangerous goods

Problem of pedestrian access
Temporary traffic re-diversion is often required in roadworks.

Working with live traffic is a very hazardous operation.

Temporary traffic re-diversion is often required to provide safe vehicular and pedestrian traffic.
Marine works – Improvement to Eastern Corridor at Quarry Bay
Marine works – Container Terminal No. 9

Marine Works – Central Pier No. 8

Marine work, storm water discharge outfall for the Central Reclamation, Phase III

Forming of the berth deck as apron and loading/unloading area of the terminal
The end of Part 1 Presentation