

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

Common hazards often encountered in construction

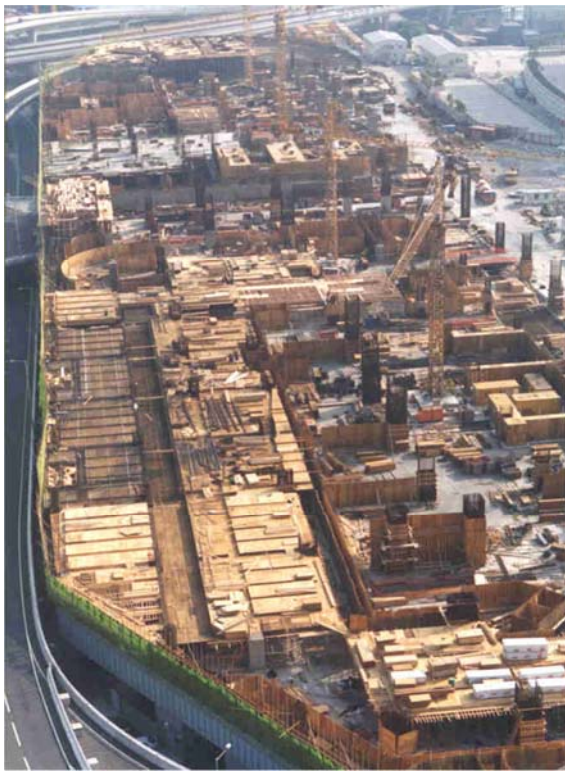
10. Manual handling of materials
11. Demolition works
12. Possible fire hazards
13. Working in noisy, dusty, fummy or polluted environment
14. Working at height
15. Working at confined space
16. Working with pressurized equipment
17. Working on servicing roadway
18. Working over water/marine environment



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





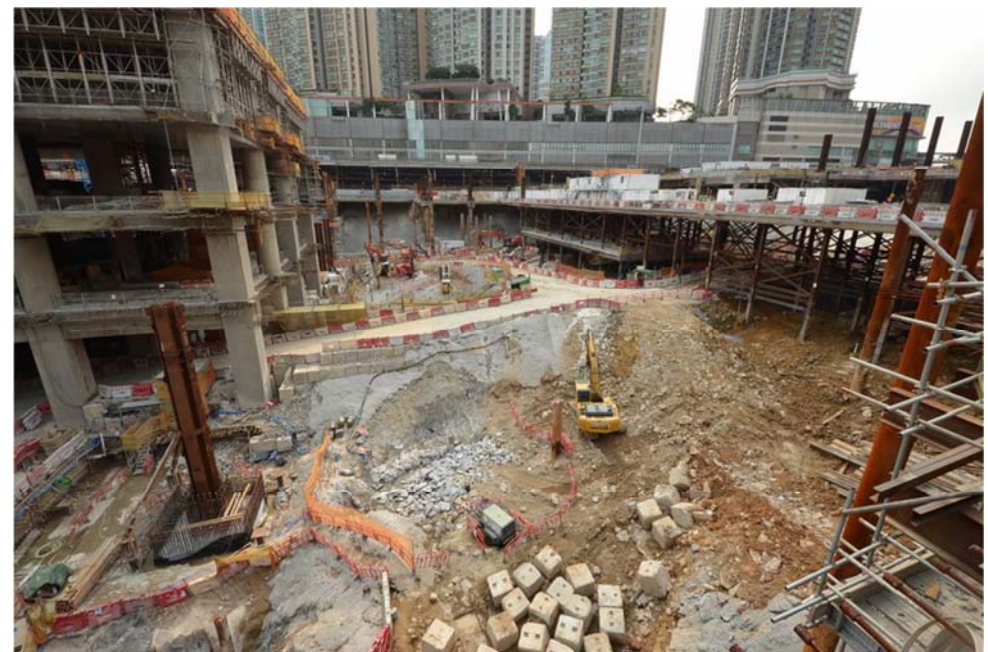
Examples of very large and complicated site with countless hazardous work locations



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

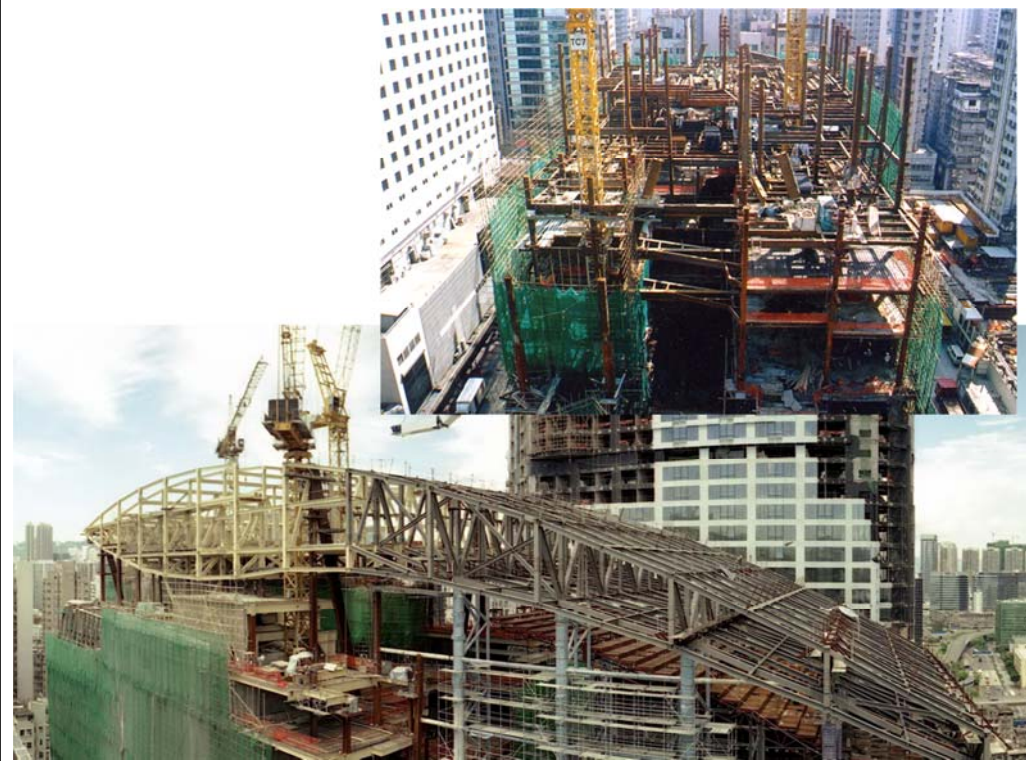


Large-size building structure involved countless construction jointing as part of its work planning/phasing arrangement





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



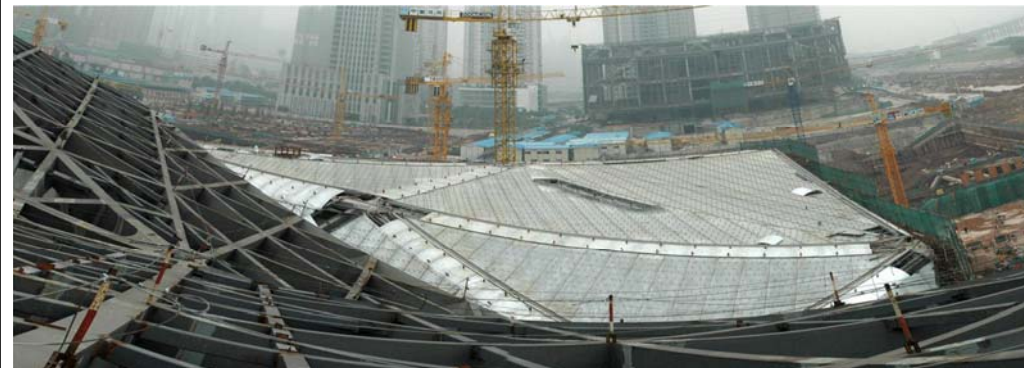
Working at high level



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



Working with very difficult and hostile work environment



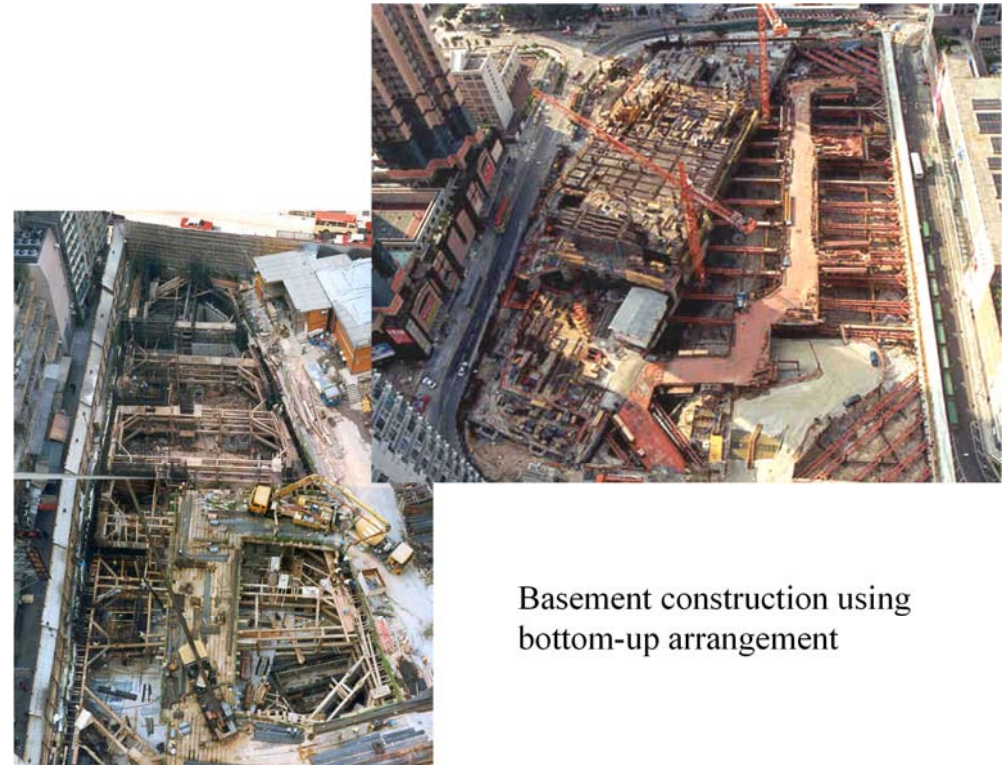
Working with very difficult and hostile work environment



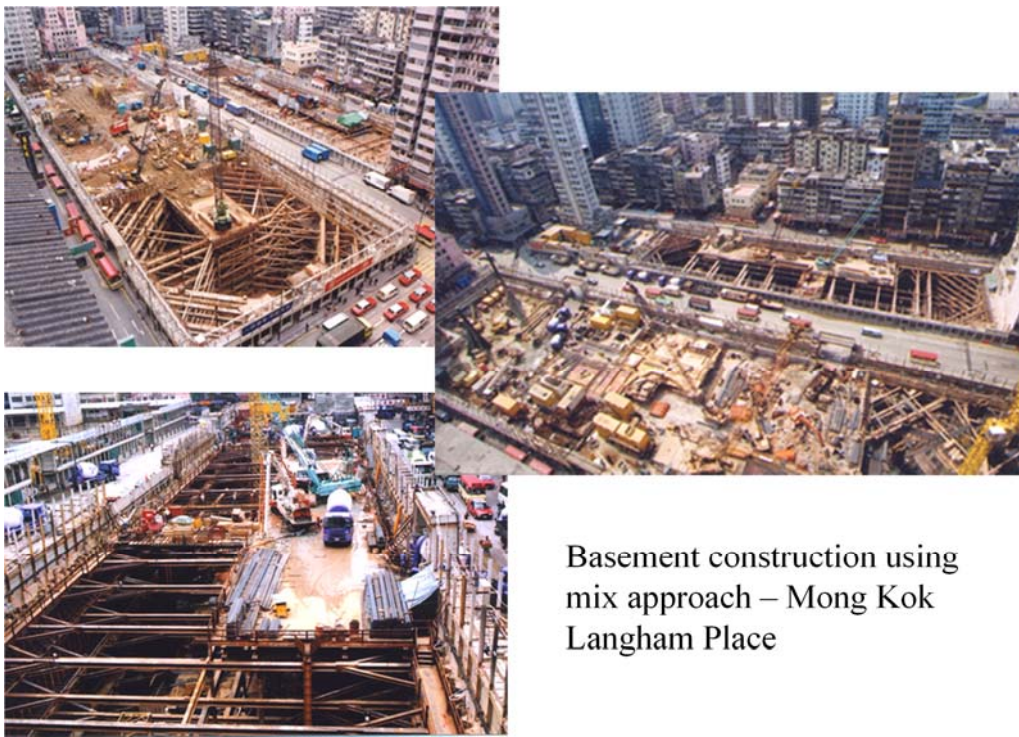


Construction site carrying out foundation and site formation works

Complicated excavation process near live traffic



Basement construction using bottom-up arrangement



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



Building projects involving complicated slope and site formation works



Large-panel steel form used to
construct an isolated core

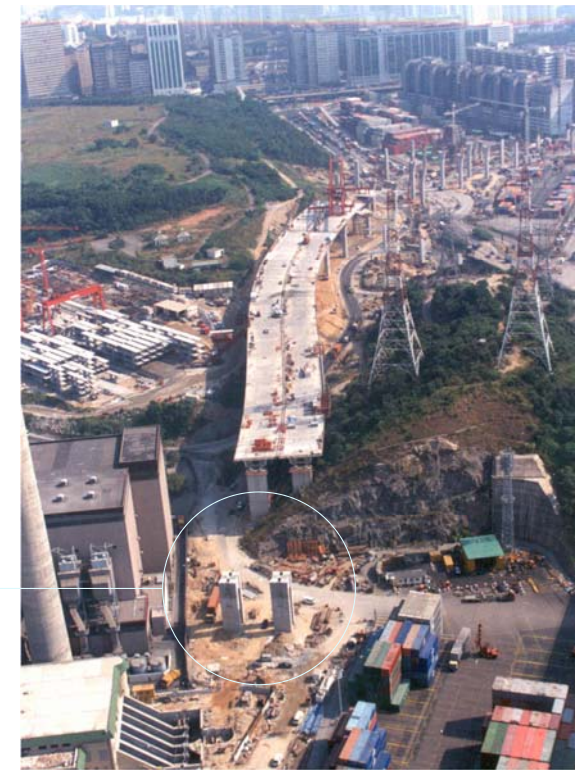


Work platform at high level



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



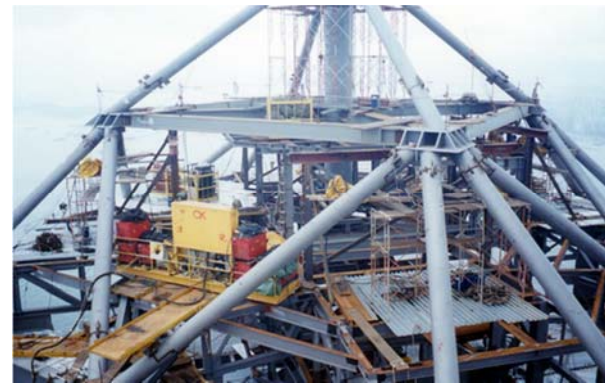
Installation of escalators inside huge interior space



Working with structural steel erection,
(Cheung Kong Center)



Working with structural steel erection, (The Center)

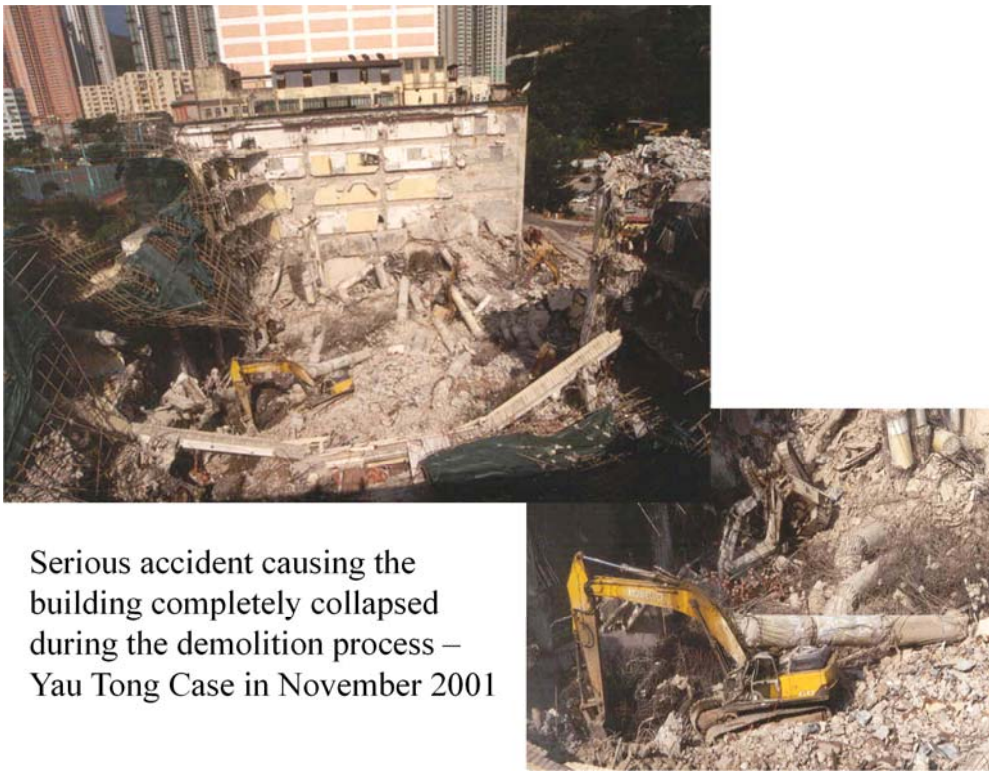


Demolition of
building with large
building area



Demolition works within
congested urban environment





Congested site working environment with very limited working space





Congested site working environment with very limited working space



Handling of building materials and heavy equipment



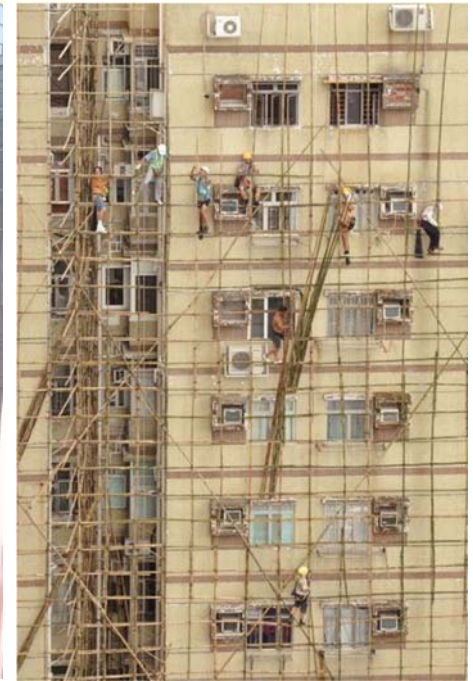
Difficult access into working spot



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



Further examples of messy interior



Further examples
of messy interior



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



Temporary traffic re-diversion is often required to provide safe vehicular and pedestrian traffic



Working with live traffic is a very hazardous operation





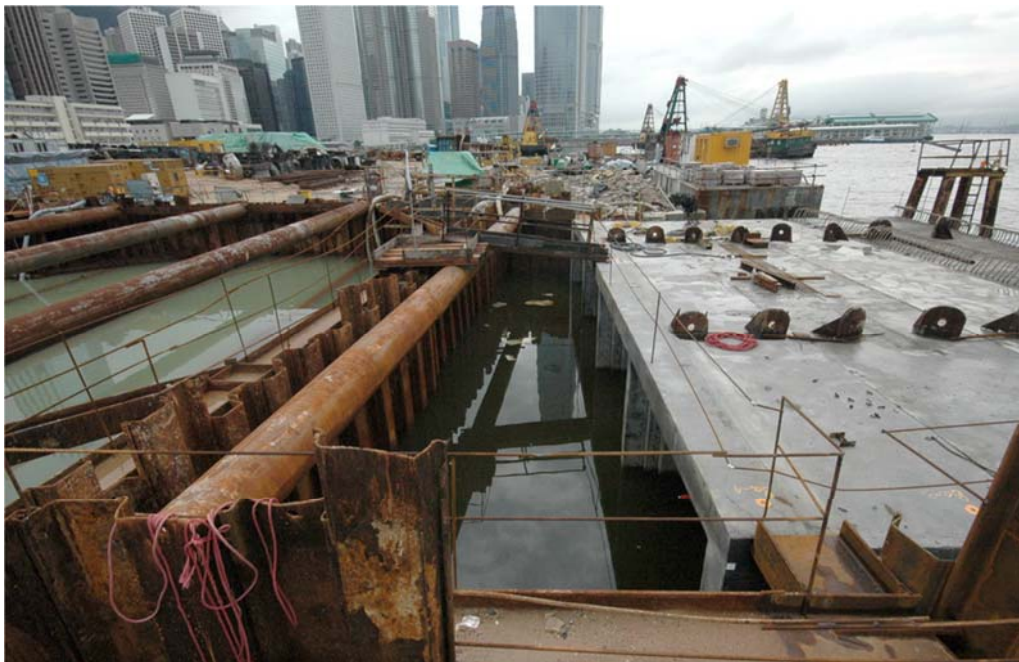
Marine works –
Improvement to
Eastern Corridor at
Quarry Bay



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