



# "From Cradle to Cradle" Workshop on Planning & Design for Safety in Project Life Cycle for Public Housing Developments

Geotechnical Engineering Works

by

William Wong, CGE

**Planning & Design for Safety** 

Development & Construction Division Housing Department

Construction

rom cradle to cradle

31/3/2010

### Contents

Project Life Cycle

From cradle to cradle

Safety Aspects in Slopes

Maintenance

Safety Aspects in Ground Investigation Works

Construction

Operation

Planning & Design for Safety

Use

### Safety Aspects in Slopes

Safety Considerations in Design

- Safety Measures during Construction
- Safe Access for Slope Inspection and Maintenance

Slope Management and Maintenance

## Safety Considerations in Design

- Adequate Safety Factor corresponding to Consequence-to-life and Economic Consequence Categories
- Adequate Clear Intervening Space from Buildings

Planning & Design for Safety

### Project Life Cycle

Clear Inter∨ening Space



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## Safety Considerations in Design

- Adequate Safety Factor corresponding to Consequence-to-life and Economic Consequence Categories
- Adequate Clear Intervening Space from Buildings

 Slope Surface Protection with due consideration of "Greening" for the Slope



Hydroseeding Slope Surface Protection

## Safety Considerations in Design

- Adequate Safety Factor corresponding to Consequence-to-life and Economic Consequence Categories
- Adequate Clear Intervening Space from Buildings
- Slope Surface Protection with due consideration of "Greening" for the Slope

Slope Surface Drainage Provision

### Project Life Cycle



Slope Surface Drainage System

## Safety Considerations in Design

- Adequate Safety Factor corresponding to Consequence-to-life and Economic Consequence Categories
- Adequate Clear Intervening Space from Buildings Management
   Opstruction
- Slope Surface Protection with due consideration of "Greening" for the Slope
- Slope Surface Drainage Provision
   Slope Surface Drainage Provision
- Details to enhance safety

CHAIN-LINK-FENCE







nagement

U-CHANNEL COVER





HAND-RAIL ALONG BERM

Safety

### Safety Measures during Construction

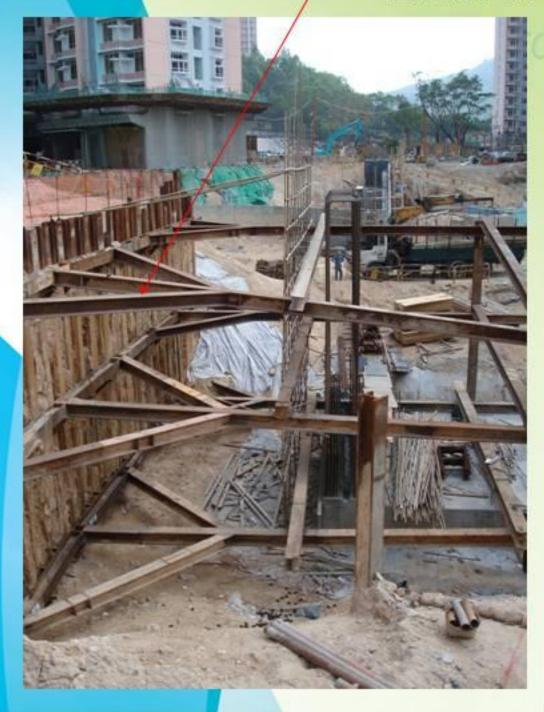
Quality Site Supervision for Slope Works

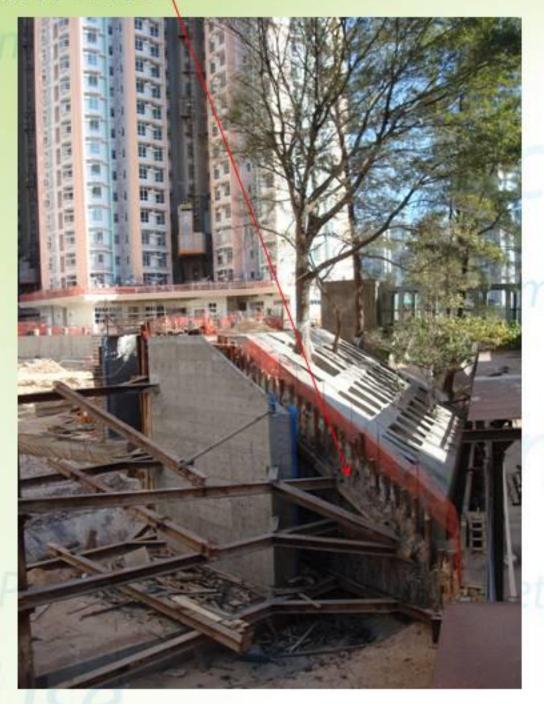
- Verification of Design Assumptions during
   Construction

  Management
- Safe Temporary Works for Excavation Works and Soil Nailing Works

Planning & Design for Safety

### TEMPORARY WORKS FOR EXCAVATION WORKS





### TEMPORARY WORKS FOR **EXCAVATION WORKS**



esign for Safety

### TEMPORARY PLATFORM FOR SOIL NAILS WORKS

rom gradle to cradle





### Safety Measures during Construction

- Quality Site Supervision for Slope Works
- Verification of Design Assumptions during Construction

Management

- Safe Temporary Works for Excavation Works and Soil Nailing Works
- Precautionary Measures during Heavy Rainfall Period

Emergency Attendance

## Safe Access for Slope Inspection and Maintenance

- Code of Practice on Access and Safety Precautions
- Provision of Intermediate Berms on Slope Management

   Onstruction
- Provision of Staircase for Access to Berms
- Provision of Railing along Berms & Design for Safety



Project Life Cycle



Access Staircase

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## Slope Management and Maintenance

- Slope Registration and Updating the Catalogue of Slopes
- Production of Slope Maintenance Manual, including
  - a. Providing Basic Information and As-built Records of the Slope
  - b. Recommending Minimum Frequencies for Routine Maintenance Inspection and Engineer Inspection
  - c. Providing a List of Items requiring Routine Maintenance
  - d. Providing Information on Water Carrying Utilities that may affect the Stability of the Slope

### Redevelopment of Sau Mau Ping Estate Phases 13 & 16

Clear Intervening Space

Hand Railing

Access Staircase

Berm



Safe Slope

Slope Surface Drainage System

Hydroseeding Slope Surface Protection

## Safety Aspects in Ground Investigation Works

Occupational Safety and Health

Safety Measures in Ground Investigation (GI)anagement
 Fieldworks

Safety Training for Site Staff

Planning & Design for Safety

### Occupational Safety and Health

 Provision of Mobile Site Office and Toilet at GI Work Site

Management

Construction

Operation

Planning & Design for Safety

Use



Project Life Cycle

radle to cradle

laintenance

TOILEThagement

MOBILE SITE OFFICE



### Occupational Safety and Health

- Provision of Mobile Site Office and Toilet at GI Work Site
- Provision of Adequate Potable Water
- Provision of Safety Hamlets, Safety Shoes and Wet Weather Gears for Site Staff
- Other Precautionary Measures (e.g. Against Heat Stroke, High Air Pollution )



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### Safety Measures in GI Fieldworks

 Checking Underground Utility Records from Utility Undertaking

Management

Use of Electronic Device to locate
 Underground Utilities

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### UNDERGROUND UTILITIES



### Safety Measures in GI Fieldworks

 Checking Underground Utility Records from Utility Undertaking

Management

- Use of Electronic Device to locate
   Underground Utilities
- Excavation of Inspection Pit before Drilling

### INSPECTION PIT



### Safety Measures in GI Fieldworks

- Checking Underground Utility Records from Utility Undertaking
- Use of Electronic Device to locate Underground
   Utilities
- Excavation of Inspection Pit before Drilling

 Use of Protection Guard to Protect Workmen from Rotary Part of Drill Rig

### Protection Guard & Rotary Part

Safety Hamlet & Reflective Vest for Site Staff



Protection Guard for Rotary Part of Drill Rig

Fencing off GI Area

Sarety



## Safety Training for Site Staff

 Provision of 1-Day Construction Safety Certificate Course for "Green Card"

Provision of 1-Day Workers of Confined Space
 Operation Certificate Course

Provision of 4½-Day Safety Training for Resident Site
 Staff

### Drilling on a Slope

**Drill Rigs** 

Safe Working Platform



Access to Working Platform

Measures to Prevent Pedestrian Access

### Conclusion

- Safety is the culture to be inherited from early site planning till maintenance, i.e. at all times
- Designs of all types of works should consider safety seriously. All works should have a safe design and can be constructed in a safe manner

 Safety and health of site personnel are contributing factors to success of a project

## Thank you