

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

## ***Geotechnical Engineering Works***

by

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*From cradle to cradle*

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# Contents

*Project Life Cycle*

*From cradle to cradle*

- Safety Aspects in Slopes
- Safety Aspects in Ground Investigation Works

*Maintenance*

*Management*

*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



Clear  
Intervening  
Space





# 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





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Hydroseeding  
Slope  
Surface  
Protection

safety

Use



# 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





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
- Slope Surface Protection with due consideration of “Greening” for the Slope
- Slope Surface Drainage Provision
- Details to enhance safety



CHAIN-LINK FENCE



U-CHANNEL WITH COVER

U-CHANNEL COVER



HAND-RAIL ALONG BERM



# Safety Measures during Construction

- Quality Site Supervision for Slope Works
- Verification of Design Assumptions during Construction
- Safe Temporary Works for Excavation Works and Soil Nailing Works



## TEMPORARY WORKS FOR EXCAVATION WORKS





# TEMPORARY WORKS FOR EXCAVATION WORKS



Project Life Cycle

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# TEMPORARY PLATFORM FOR SOIL NAILS WORKS

*Project Life Cycle*

*From cradle to cradle*



*Planning & Design for Safety*

*Use*



# Safety Measures during Construction

- Quality Site Supervision for Slope Works
- Verification of Design Assumptions during Construction
- 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
- Provision of Staircase for Access to Berms
- Provision of Railing along Berms





Hand Railing

Berm

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Safety

Use





Access  
Staircase

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Safety

Use



# 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) Fieldworks
- Safety Training for Site Staff



# Occupational Safety and Health

- Provision of Mobile Site Office and Toilet at GI Work Site





MOBILE SITE OFFICE

Project Life Cycle  
Cradle to cradle  
Maintenance  
Management

TOILET





# 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 )



# Project Life Cycle



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# Use

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

• Caring • Customer-focused • Committed • Creative



# Safety Measures in GI Fieldworks

- Checking Underground Utility Records from Utility Undertaking
- Use of Electronic Device to locate Underground Utilities



# ELECTRONIC DEVICE TO LOCATE UNDERGROUND UTILITIES

Project Life Cycle



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# 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



## 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 Helmet  
& Reflective  
Vest for Site  
Staff



Protection Guard  
for Rotary Part  
of Drill Rig

Fencing off GI  
Area



## Protection Guard & Rotary Part





# 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**