

# 12. Geotechnical Engineering Works (Safety Aspects in Slopes and Ground Investigation Works)

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- Safety Aspects in Slopes
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## Safety Aspects in Slopes

- Safety Considerations in Design
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- 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
- Slope Surface Protection with due consideration of "Greening" for the Slope
- Slope Surface Drainage Provision
- Details to enhance safety



Clear intervening space



Slope surface drainage system



Hydroseeding slope surface protection



Chain-link fence



U-channel with cover



U-channel cover



Hand-rail along berm

## 12. Geotechnical Engineering Works (Safety Aspects in Slopes and Ground Investigation Works)

### Safety Measures during Construction



Temporary works for excavation works



Temporary platform for soil nails works

- 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



Berm

Hand railing



Access staircase

## 12. Geotechnical Engineering Works (Safety Aspects in Slopes and Ground Investigation Works)

- 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



### 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



Toilet

- 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 )



Personal protection equipment

*Adequate safety measures are the key  
Putting the whole family at ease*

## 12. Geotechnical Engineering Works (Safety Aspects in Slopes and Ground Investigation Works)

### 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



Electronic device to locate underground utilities



Inspection pit

Safety helmet & reflective vest for site staff

Protection guard for safety of rotary part of drill rig

Fencing off GI area



Protection guard & rotary part



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

### 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

Drill rigs

Access to working platform

Safe working platform

Measures to prevent pedestrian access



Drilling on a slope