Tell-Tale Signs and Rectification

If there are tell-tale signs (Figure 3), owners and management corporations should:

- Engage a Professional Engineer (PE) in Civil/ Structural/ Geotechnical discipline to inspect, assess and recommend rectification measures.

The list of PE can be found at the Professional Engineers Board website www.peb.gov.sg

- Rectify the defects as recommended by the PE

Figure 3: Cross Section Showing Various Tell-Tale Signs

Cracks appearing on the ground near to top edge of slope

Cracked or damaged slope surface protection

Sunken ground/water ponding

Choked up by debris

Cracked or broken drain

Choked weep hole with no water flowing out during raining days

Tilt or misalignment

Cracks/eroded cement mortar/growing vegetation

Crack on earth retaining wall (rc/rubble/brick)

Up-heaving of ground near to the toe of slope

Water ponding

Damaged slope surface protection (turfing/shotcrete/stone pitching) leads to soil erosion

Safe Slope and Slope Protection Structures
(Regular Inspection and Maintenance)

For Building / Land Owners & Management Corporations
**Slope Protection Structures**

Slope protection structures help to stabilise the slope and can last a lifetime in protecting surrounding properties from damage and people from injury if they are maintained in a good and functional condition at all times.

Slope protection system may comprise one or a combination of the following:
- Slope surface protection
- Slope protection structure (including reinforced concrete (RC) earth retaining wall, rubble / brick wall, bored-pile wall, diaphragm wall, tie-back wall made of RC or steel sheet pile, etc)

Figures 1 and 2 show the functions of various slope surface protection and a typical reinforced concrete (RC) earth retaining wall respectively.

**Safeguarding your property from slope erosion or sliding**

To ensure that slope protection system functions properly, owners and management corporations should:
- Be vigilant to look out for defects or damages
- Be proactive in regular inspection and maintenance
- Rectify defects to prevent soil erosion and water inflow during heavy rainfall that may trigger slope and slope protection structures, which have stood for many years, to fail due to poor maintenance and deterioration over time

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**Figure 1. Various Types of Slope Surface Protection**

- Surface drain to channel away surface run-off water
- Turfing to protect the slope surface from soil erosion
- Stone Pitching
- Shotcrete
- To prevent inflow of water and protect slope surface from soil erosion
- Weepholes to drain out water so as not to weaken the soil strength

**Figure 2. Typical Cross Section of RC Earth Retaining Wall**

- Surface drain to channel surface run-off water away from slope
- Turfing to protect the slope surface from soil erosion
- Stone Pitching
- Shotcrete
- Weepholes to drain out water so as not to weaken the soil strength
- Subsoil pipe to drain away water
- Lean concrete
- Stones wrapped with geotextile to drain and filter ground water
- Water table level