

# Q&A's from online residents' meeting - 31.1.22

## 1. What are destabilising forces? [GW]

Destabilising forces include overloading of the ground, saturation of layers due to precipitation and groundwater changes, cutting or modification of slope toes and deformation of or changes in material strength.

When the force of gravity acting on a slope exceeds the resisting forces of a slope, the slope will fail, and a landslide occurs.

## 2. How is public access going to be prevented from the slope? [LV-P]

Public access will need to be considered by NPTCBC and landowners.

There is a difference between a person going onto the quarry spoil tip for a short duration; this might be a voluntary activity and pupils and staff in a school where a Local Authority has a duty of care for the school users/occupants.

## 3. How confident are you that the data you have depicts a reliable picture? [CG]

Given the nature of the site, several limitations were imposed on the investigation. Limited access to the site was primarily due to constraints posed by dense vegetation and steeply sloping ground. Works were only carried out where safe access and working areas could be achieved. Vegetation clearance was undertaken to gain access to previously inaccessible areas however, a large proportion of the study area remains covered with vegetation and limited, to no investigation was undertaken in these areas.

Several investigation options were reviewed taking into consideration many factors including but not limited to, Health and Safety, the effectiveness of the method and cost. Intrusive investigation could only be undertaken in areas of cleared vegetation and where it was safe to do so. Geophysical survey was implemented to supplement the Ground Model.

Assessments have been undertaken on the available information considering the site constraints. Modelling has been careful to acknowledge uncertainties

linked to the constraints. The Ground Model, material parameters and groundwater conditions have primarily been determined from the investigation and geophysical findings, along with established correlations.

Considering the reduced availability of information on ground parameters, the values used in the model were adopted from a combination of in-situ testing and laboratory testing or established correlations from other soil characteristics and information to specific materials is discussed. We considered that this approach provided a realistic indication of the soil and water conditions at the site.

#### **4. What is the elevated risk above ambient conditions in the valley? [LV-P] What happened to make the council to get geotech on the slope? [J]**

Ambient valley conditions vary considerably with areas of higher and lower risk. In recent times we have reviewed the hazard and risks related to the Pantteg, Ty Gwyn and Cilmaengwyn landslides, all of which are located within the same general area in the lower Swansea valley.

The quarry spoil tip is a discreet, man-made, non-engineered feature and is generally confined to a narrow zone above the school. Following these assessments, we were asked to provide an assessment of the terrain above Godre'r graig school to assess land stability hazards and outline risks for consideration.

#### **5. Is the Australian Geomechanics Society approach compatible with the Eurocode7 partial factors of safety? [LV-P]**

Investigation and assessment were implemented following the initial study. This included investigation of the upslope tip to allow monitoring and slope stability assessment.

The quarry spoil tip is a discreet, man-made, non-engineered feature and is generally confined to a narrow zone above the school. The partial factor approach was utilised based on our brief and to understand the quarry spoil tip stability in modern day design approaches/sensitivity based on quantitative/factual ground model information. This was also so that discussions on allowable FoS could be entered into should engineered improvement works be preferred and possible.

Investigation has been generally limited to the quarry spoil tip and has yielded a relatively limited set of information when considering the land area, and volume of material within the tip. Limit equilibrium methods (e.g. SlopeW) are appropriate when data is limited or it is necessary to make an initial stability estimate.

**6. How is the school too dangerous to use, but my property which is directly across the road, 30ft away is at low risk. Where is the risk line drawn? [J]**

Based on conditions at the time of the assessment, the consequences to the school of a landslide are different than for residential houses. Based on observations there is likely to be a lower volume of material on the flanks of the quarry spoil tip and the direction of travel of a landslide from the quarry spoil tip would likely be perpendicular to the slope contours, i.e., towards the school.

A qualitative assessment based on AGS (2007) was undertaken based on a degree of belief approach for the wider village area. Probabilities of detachment and runout considered suggest a likelihood of impact on residential properties of:

- $>10^{-4}$  i.e. “unlikely” for slopes of  $27^\circ$  or more
- $>10^{-5}$  i.e. “rare” for slopes of  $27^\circ$ - $23^\circ$
- $>10^{-6}$  i.e. “barely credible” for slopes of  $<23^\circ$

The consequences of impact were considered to be moderate damage to some of the structure i.e., medium consequence. This suggests a “low” to “very low” risk to residential property from this hazard, depending on the slope angle. This is “usually acceptable to regulators” (AGS, 2007).

**7. I do feel that as it is not functioning school should be referred to as a building, as considering it as a school makes it an emotive issue. [LV-P]**

The exposure of pupils and staff is conceptually different, i.e. exposure duration, concentration of people and voluntary versus involuntary risks. Based on conditions at the time of the assessment, the consequences to the school of a landslide are different.

**8. Would the naturalised area be like the neglected area of the Pant y ffynon/ Godre'rgraig landslip Or would it look different to this? [LV-P]**

Visual appearance and land function will need to be considered by NPTCBC, individual landowners and other relevant stakeholders (e.g. planning and ecology).