

Failures at slope cuts in clastic sedimentary bedrock in Malaysia

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Interbedded sandstones, siltstones and shales are the dominant clastic sedimentary rocks of Malaysia and are exposed at slope cuts where an upper Zone I (residual soil) of completely weathered bedrock modified by pedological processes is seen. Zone I is up to 6 m thick and overlies the *in situ*, slightly to completely weathered bedrock of Zone II that

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preserves the minerals, textures and structures of the original strata; the degree of preservation increasing with depth. Low cuts and the top benches of high cuts in undulating to hilly and mountainous terrain expose Zone I and have experienced small earth falls and shallow slips during periods of continuous daily rainfall. Where the cuts intersect unconfined groundwater tables, slumps and compound slides are observed. In hilly to mountainous terrain, the lower benches of high cuts (>10 m high) expose Zone II and have experienced small to large, block and slab slides as well as wedge failures, during periods of continuous daily rainfall. At some very steep benches exposing indurated (hard) bedrock, toppling failures and rock falls have sometimes occurred during rainfall. Design of slope cuts in clastic sedimentary bedrock in Malaysia thus needs to take into consideration their geometry, topographic setting, exposed lithologies and structural discontinuity planes as well as weathering and rainfall patterns.