The North-South Expressway Central Link: engineering geology

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The North-South Expressway Central Link (NSECL) connects the North-South Expressway (NSE) north of Kuala Lumpur to the NSE south of Kuala Lumpur, so that motorists travelling northbound or southbound in the vicinity of Kuala Lumpur can bypass Kuala Lumpur for a smoother ride. The NSECL commences at a proposed new interchange on the existing New Klang Valley Expressway (NKVE) near Shah Alam, traverses southwards through Batu Tiga, Puchong, Kuala Langat, before turning eastward at around Dengkil to join the NSE at approximately 6 km north of the existing Nilai Interchange. The NSECL also connects the NKVE to the new

Warte Geologi, Vol. 22, No. 3, May-Jun 1996

214 Kuala Lumpur International Airport (KLIA) at Sepang. The total length of the NSECL is about 48 km.

The proposed NSECL highway alignment falls within Topography Map Sheet 94 (Kuala Lumpur) and Sheet 102 (Sepang). The rock formations traversed by the highway alignment consist of the Kenny Hill formation, granite and limestone. Superficial or surface deposits include alluvium, mine tailings, swamp/peat deposits and residual soils of the Kenny Hill formation and granite. For example, recent alluvium is abundant along the major rivers crossed by the highway alignment (eg. Sg. Damansara, Sg. Kelang and Sg. Langat). Mine tailings and exmining ponds are abundant in the Ayer Hitam Tin (Puchong) and Selangor Dredging (Dengkil) areas. Swamp/ peat deposits are encountered in the low-lying areas from Kg. Tanah Liat to Bt. Baja-Bt. Badak and further southeast in the Sg. Langat area.

The topography is closely related to or dictated by the underlying geology, with three general topographic expressions as follows: i) granitic terrain comprising high hill with steep slopes (e.g. Bt. Lanchong at 149 m is the highest peak along the entire alignment), ii) Kenny Hill formation forms low, undulating hills generally cultivated with oil palm or rubber, and iii) limestone flats underlain by limestone bedrock with superficial deposits of alluvium, mine tailings, etc.

Borehole data (some 50 boreholes) along the alignment by-and-large confirmed the geology as encountered on the surface. The borehole data also shows the occurrence of limestone bedrock near the NKVE (Shah Alam) area, at shallow depths ranging from 13–19 m. The limestone bedrock here (Shah Alam) is overlain by residual soils of the Kenny Hill formation and/or alluvium.

Some possible construction problems and potential geo-hazards include: soft grounds/lowlands underlain by soft Quaternary deposits (alluvium, peaty soils, organic clays, etc.); ex-mining lands at Ayer Hitam Tin and Selangor Dredging areas which are littered with numerous mining ponds, slime ponds and sand tailings, all of which are problematic materials to work with; karstic terrain in the Ayer Hitam Tin area with its karstic or solution features in the underlying limestone bedrock and associated problems such as subsidence and sinkholes; landslides or slope failures especially in the more hilly granitic terrain around Bt. Lanchong. Cut-slope failures in the Kenny Hill formation, in particular involving the "black" graphitic schist/phyllite materials, can be expected; excavation may require blasting of hard materials such as granitic rocks, and quartzite of the Kenny Hill formation.

Construction materials such as earthfill (borrow materials), sands and rock aggregates appear to be available in the immediate vicinities of the proposed highway alignment and should not be a problem. Suitable fill materials can be sourced from the residual soils of granite or the Kenny Hill formation.

Sands are available from mine tailings or along major river banks or river beds. Existing rock quarries (granite) in the Puchong and Nilai areas can be sourced for rock aggregates.

Warta Geologi, Vol. 22, No. 3, May-Jun 1996