

The marine geology off the North Lantau coast, Hong Kong and its application to infrastructure development

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Laporan (Report)

Dr. J.W. Ceri James, who is with the Coastal Geology Group, British Geological Survey, gave the above talk on 24 November 1993 at 5.00 pm at Geology Department, University of Malaya, Kuala Lumpur. It was attended by 32 members. For the benefit of members in the Ipoh area, Dr. Ceri James gave the talk again at the Makmal Jabatan Penyiantasan Kajibumi, Ipoh.

The talk proved to be very interesting and well illustrated as Dr. Ceri James touched on the geology and borehole data before focusing on the progress of reclamation and construction of the different infrastructure projects in particular the replacement airport site at Chek Lap Kok and the North Lantau Expressway.

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Abstrak (Abstract)

In recent years an extensive grid of seismic reflection profiles, boreholes and some piezocones have been completed off the North Lantau Coast, Hong Kong. The grid is formed from a number of different infrastructure projects including, the replacement airport site at Chek Lap Kok, the North Lantau Expressway to the replacement airport, marine fill resource surveys reclamations and surveys commissioned by the Hong Kong Geological Survey to complete the grid. This data has been integrated by the Hong Kong Geological Survey to produce 1:5,000 and 1:20,000 geological maps of the area.

The interpretation of these seismic profiles, calibrated with boreholes and piezocones, has led to the subdivision of the offshore Quaternary sediments into a number of formations based on seismic reflector style, lithology, palaeontology and erosional and depositional history. The Quaternary formations can be connected to major oscillations in sea level associated with glacial and interglacial cycles. The form and lithologies of the formations can be related to their response to the erosional and depositional events associated with these cycles.

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These global and regional events have an important influence on the character of the geology of localities such as the new replacement airport. The form of the geology at this site, and elsewhere in the area, can be more readily understood for design, reclamation and construction when the regional context is taken into account.

The topics addressed in the talk included:-

- Sediment and bedrock distribution and their relationship to the tidal current regime
- Seismic stratigraphy, lithology, sedimentology and palaeontology of the principal off-shore Quaternary formations
- Erosion surfaces, oxidised paleosols, minor and major channel networks
- Detailed analysis of two stratigraphic boreholes on and adjacent to the new airport site
- Sand bodies within major channels
- Age, thickness and extent of Holocene compressive mud blanket and its relationship to minor and major basal channelling and post-glacial tidal current conditions
- Relationship of gas and acoustic turbidity to Holocene mud filled channels

The area and topics covered are an example of the application of geological interpretation to infrastructure developments within the coastal zone. The methods, procedures and geological model produced are relevant to developments in the Malaysian coastal and marine environment including reclamations, dredging, marine fill and aggregate resources, tunnels, pipelines and cable routes.