

# **A Information for Looking for PhD & MSc Student at The Engineering Geology/Rock Mechanics Section of The University of Seoul**

Dear Sir,

## 1. About myself:

First of all, I would like to introduce myself to you. I am an engineering geologist. I did my BSc (Geology) at Korea university at 1980 and MSc (Engineering Geology) at Leeds university, U.K. at 1982, PhD (Engineering Geology under the supervision of Dr. M.H. deFreitas) at Imperial College at 1987. After came back to Korea I have worked for 8 years (1987-1995) at the Korea Institute of Geology and Mineral resources (KIGAM: formerly Geological Survey of Korea). Now I am an associate professor at the department of civil engineering at the University of Seoul since 1995. Our university is belong to the Seoul City Metropolitan Government.

## 2. Present activity:

Since I came back to Korea at 1987, I have researched natural landslides and man-made cut slopes for 20 years. Now I am Head of Landslide Research Centre leading a landslide research team (50 members) funded by National Emergency Management Agency, Ministry of Government Administration and Home Affairs, Korea. Our project will be scheduled from Sept. 2006-April 2011.

I would like to introduce our research team. Korea suffers from various natural and artificial hazards. To reduce the casualties and property-losses from natural and artificial hazards, National Emergency Management Agency (NEMA) was established as an organization of Ministry of Government Administration and Home Affairs, Korea.

Last year Korean government made a law to control man-made cut slopes existed in Korea. Therefore in May 2006, NEMA announced R & D project on Development methods to estimate cut slope failures and how to control them. Our team was finally selected after competition between 3 consortiums.

Our 50 research members consisting of various universities, government research institutes and private designing and construction, companies are researching techniques for site

investigation, soil and rock testing, decision of geotechnical parameters, designing, reinforcement, monitoring, maintaining and data base etc.

I will give an announcement about Korean landslides as a national representative at the International Forum on Landslide Disaster Management, December 2007, Hong Kong. This Forum is organized under the auspices of the Joint Technical Committee on Landslides and Engineering Slopes (JTC-1) of the ISSMGE, ISRM and IAEG. The Hong Kong Geotechnical Society, Hong Kong Institution of Engineers and Geotechnical Engineering Office of the Hong Kong SAR Government will host the event.

3. my present interesting research topics:

(1) Shear strength of the boundary of soil and rock.

Korea consists of 70% mountainous area. On the ground surface of 30-degree inclination in mountainous area the depth of weathering (Residual soil) is limited to 1-2m in thickness. Thus during the Typhoon seasons of June to September most of landslides occur along the boundary between soil and rock. Thus recently I have studied the shear strength of the boundary of soil and rock on various rock types such as Igneous, Metamorphic and Sedimentary rocks. My research results show the shear strength of the boundary of soil and rock is lower than the soil itself.

(2) Miniature landslide model test:

I have researched the shallow landslide which is also a dominant type of landslide in Korea. Most of landslides occur along the boundary between shallow soil of 1m thickness and bed rock. Nowadays I will try to make the landslide miniature tester in order to know the process of rock-soil boundary landslide.

(3) Rock mass properties of corestone weathering profile: (so called "Melange")

From the time of PhD research I have interested in the engineering characteristics of the mixture of soil and rock, so called "melange", thus from a few years ago I have studied in the engineering characteristics of melange. Last a few years I have studied the trend of uniaxial compressive strength at various % of corestone. Now I try to study the size and shape effects of melange on triaxial compressive strength. Also I want to know the fracture development by using MRI (Magnetic Resonance Imaging) instrument, which is widely used tools in the field of medical investigation.

(4) Engineering geological map of Seoul

5 years ago, I made an engineering geological map of Seoul, named as "GEO-SEOUL". It was sponsored by the Seoul city and took 2 years to complete.

Being unfamiliar with computer programming, I asked a computer programmer to make the GEO-SEOUL in the way I want it to be done. 10,000 drilling logs used for underground subway and foundation of buildings and houses had been collected. Among them 6,500 drilling logs were

chosen after careful consideration on their reliability. Format of the drilling logs, its terminology and order of description were not standardized. Thus I made a standard logging format and made all the drilling logs re-written according to the standard logging format.

The programme shows both large-scaled and small-scaled digital topographical and geological map. If you click one of drilling logs shown in the topographical map, the drilling log information are shown in the manner of standard logging format.

The programme also can predict the degree of weathering with depth even if at a certain location which has no logging data. Also, the programme can show the over-all distribution of rock head, fracturing and ground water table. If a certain boundary and depth are being dictated (for example at -10m depth from the ground surface), the programme will show the distribution of weathering, fracturing and ground water table within the boundary (at a certain depth, e.g. -10m). Also the programme shows a cross-sectional view at a certain line, showing the intensity of weathering and water table, and also a 3-dimensional block diagram, which can be rotated.

#### (5) Corrected RQD % for SHALE

I have some field experiences with Shale in Korea. Because Shale has often weak strength along the bedding, it should be carefully considered about what the real RQD % values mean. From intensive point load strength test with Shale, I would like to suggest that the "corrected RQD % values" which is lower than the real RQD % value, should be used rather than the real RQD % value if NX core can be separated into two part with light hand force, as the diagnosis 'breakability of NX core in the hand', has frequently been quoted as a means to distinguish MW and HW materials (Terzaghi and Peck (1967)). Thus I would like to publish a paper, "A Study on Engineering characteristic and Suggested Methods for Determining RQD % as for Shale".

#### (6) Field seismic test results in corestone weathering profile

In corestone weathering profile, it is very difficult to define the boundary between blasting rock and ripping rock. Also, the well-known figure (Enclosure 5) of rock quality classification in relation to excavation suggested by Dr. J.A. Franklin (1971) can not be applied to corestone weathering profile. According to my field seismic test results conducted in corestone weathering profile in Korea, also the field seismic test can be applied with a high reliability to corestone weathering profile by considering general workability and efficiency of excavation tools. Thus I would like to write a paper such as "Application of field seismic velocity to predict the diggability (blasting rock, ripping rock) in corestone weathering profile".

#### 4. Looking for PhD & MSc chinese students who can speak/read Korean:

I am looking for a few Chinese post-graduate students for MSc and/or PhD courses (or Post-

Doctor).

I wonder whether you can recommended any diligent Chinese student (majoring geotechnical engineering and/or geology) interested in my research fields. Specially I prefer Chinese student speaking Korean language because most of post-graduate cources are lectured in Korean at present. I would like to support the tuition fee and living expenses.

Sincerely yours,

Su-Gon LEE, PhD & DIC

Associate Professor

(Head of Landslide Research Centre),

Department of Civil Engineering,

University of Seoul ,

email : sglee@uos.ac.kr

Mobile: 82-11-9770-2407

Tel No. (Office): 82-2-2210-2407

Fax No. (Office): 82-2-2243-2407

Mobile phone No. ; 011-9770-2407

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电话: 86-10-62008066 传真: 86-10-62040574 电子邮件: [egml@mail.igcas.ac.cn](mailto:egml@mail.igcas.ac.cn) or [wufaquan@mail.igcas.ac.cn](mailto:wufaquan@mail.igcas.ac.cn)