Research Assistant

School/ Unit	School of Engineering
Level/ Classification	N/A
Employment type	Casual (6 months)
Work location	Sunway Campus, Malaysia
Date document created or updated	8 March 2018

Organisational context

Established in 1998, Monash University Malaysia is one of Malaysia's most respected universities. We are Monash University's global foot print in the Asian region, carrying with us the distinction of being the Malaysian constituent of a premier research intensive Australian university ranked among the top 100 universities in the world, and a member of Australia's prestigious Group of Eight (Go8). From humble beginnings, Monash Malaysia has grown in stature, and is now recognised as a leader in the international higher education sector in Malaysia.

As a self-accrediting University, we attract students not just from Malaysia, but from all over the world. Approximately 8,000 students representing more than 70 nationalities are currently enrolled at Monash Malaysia, and enjoy a quality academic experience.

Since our inception, Monash Malaysia has built a reputation for quality, credibility and integrity, and is held in high esteem by our students, alumni, industry and government. We encourage critical thinking to help discover new ideas, reveal new perspectives and devise solutions. We maintain a long and proud tradition of excellence in education, combined with liberal values of enquiry, providing a fertile environment for bright young minds to flourish, and life-long opportunities for those wishing to enhance their education and career.

For further information see: www.monash.edu.my.

School of Engineering

The School of Engineering continues to grow rapidly, particularly in the delivery of undergraduate programs, and through the expansion of its facilities and infrastructure. In addressing global engineering challenges of the 21st century, the expansion of research activities in our Malaysian campus is of high priority for the University, reflected by the significant increase of school collaborative partnership with the industry sector, and through the offering of the Higher Degrees by Research, the Master of Engineering Science (Research) and the Doctor of Philosophy (PhD). The School currently has close to 1,500 undergraduate students, consisting of approximately 68 academic staff, and 40 professional and technical support staff.

The School offers the 4-year Bachelor degree in 6 disciplines: Chemical Engineering, Civil Engineering, Electrical and Computer Systems Engineering, Mechanical Engineering, Mechatronics Engineering and Software Engineering. These are the 6 core disciplines of Engineering, driven by the strong and growing demand for capable graduates in Malaysia, the Asian region and beyond.

In line with the School Development Plan and to meet the thriving market demand, the school has recently started to offer the Master of Advanced Engineering (Energy and Sustainability), a 1-year Master by coursework program.

Position purpose

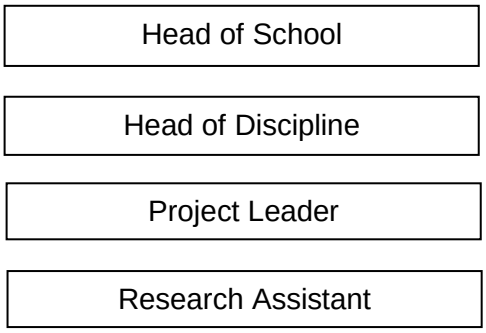
Malaysia experiences a generous annual rainfall that amounts to 990 billion cubic meters. Many urban areas are occasionally vulnerable to flash floods associated with runoff risk to adjacent properties and critical facilities. The use of porous concrete to make permeable pavement is being considered as an efficient flood control measure. Pervious pavements allow rainfall water to pass through the pavement layers and infiltrate into the subsoil – minimizing water build-up as well as runoff. Generally, permeable concrete pavements have been increasingly used in the last two decades. Durability of permeable pavements in terms of strength, abrasion resistance, clogging potential and longevity (life cycle) has been raised and investigated to warrant sustainability of the system.

The continuous use of river sand quarried from natural sources is a cost concern as well as a resource depletion action. More importantly, the pressing need to reduce cement consumption pushed for considering economically viable cementitious replacements. To this end, coal bottom ash (CBA) produced by burning of coal for energy in industrial facilities has been utilized in concrete in lieu of fine aggregate as a cheap and sustainable agent to warrant sufficient permeability in rigid pavers. Partial/full replacement of Portland cement with Fly ash (FA) has also proven to be successful in producing geopolymer (green) concrete. Both CBA and FA are common waste products in Malaysia. In addition to waste management benefits, the practice of using industrial fine waste could reduce carbon footprint to build sustainable societies.

This project seeks an optimized inclusion of CBA and FA at the expense of fine aggregate and Portland cement, respectively, to create permeable geopolymer concrete paver. The optimization scheme shall consider a good balance between strength and permeability. The success of the proposed sustainable permeable geopolymer pavement system (SPGPS) will be gauged in local context considering technical as well as econo-social dimension.

The candidate will be accountable to the Head of School of Engineering for research program responsibilities and outcomes, reporting to the Project Leader. A Research Assistant is expected to perform the tasks with minimal guidance and in a collaborative manner with a research team within the field in which he/she is appointed. He/she is expected to carry out activities to develop his/her research expertise relevant to the particular field of research.

The reporting line of a Research Fellow in the School of Engineering is as follows:



Key result areas and responsibility

Specific duties required of a Research Assistant include:

1. Participation in developing new equipment, systems and algorithms to general specifications.
2. Under general direction, assist in the set up and conduct of major experiments and research programs and/or in setting up complex equipment for a range of experiments and demonstrations.
3. Prepare reports of a technical nature.
4. Assist with more complex bibliographic and acquisition services.
5. Provide specialized technical services.
6. Develop, write and diagnosing computer programs.
7. Participate in developing new concepts, strategies, and policies within the relevant discipline.
8. Design, modeling, simulating of partial or complete system within the relevant discipline.

Key selection criteria

Essential

Degree in relevant disciplines. Apply body of broad technical and theoretical knowledge and experience. Conduct research either as a member of a team or when appropriate independently. Conduct research under minimum supervision. May have limited supervisory and line management responsibility.

Desirable

1. A completed BS in a relevant discipline.
2. Experience of working collaboratively with industry and community engagement.