

## ANGKASA CONSULTING SERVICES SDN. BHD.

Engineering Consultants

**KHOR CHAI HUAT**, Managing Director of Angkasa Consulting Services Sdn. Bhd. says that his firm specialises in water related projects with added environmental elements.



# making way for water

**Angkasa Consulting Services Sdn. Bhd. – helping Malaysia find the balance between infrastructure, liveability and nature.**



A catalyst to modernisation in Malaysia could well be her water and resources. Since the first human settlements perched along major rivers or near natural water sources, these waterways have seen steady development and the birth of key cities and town centres. But, as the Malaysian population continues to swell around these areas, these water resources require proper development and management to cope with the times.

ABOVE:

**Standing is Khor Chai Huat (Managing Director). Sitting, from left, Lee Sek Chong (Director), Dr. Lim Foo Hoat (Director), Chang Chan Yang (Director) & Mohamed Ariff Bin Awang (Director)**

Such is the role played by Angkasa Consulting Services Sdn. Bhd., a local company that specialises in developing our most vital resource – water. “We are a multi-disciplinary group that covers civil, structural, geotechnical, hydrology, mechanical, electrical as well as environmental aspects in our engineering consultancy services,” said Mr. Khor Chai Huat, the company’s Managing Director.

“We started off in 1978 as a joint venture with Gutteridge Haskins & Davey International Pty. Ltd. (GHD), an Australian firm. Over the years, we evolved and expanded to meet the company’s increasingly independent capabilities and resources. In 1989, the company was restructured to be managed and fully owned by Malaysians,” added Khor.

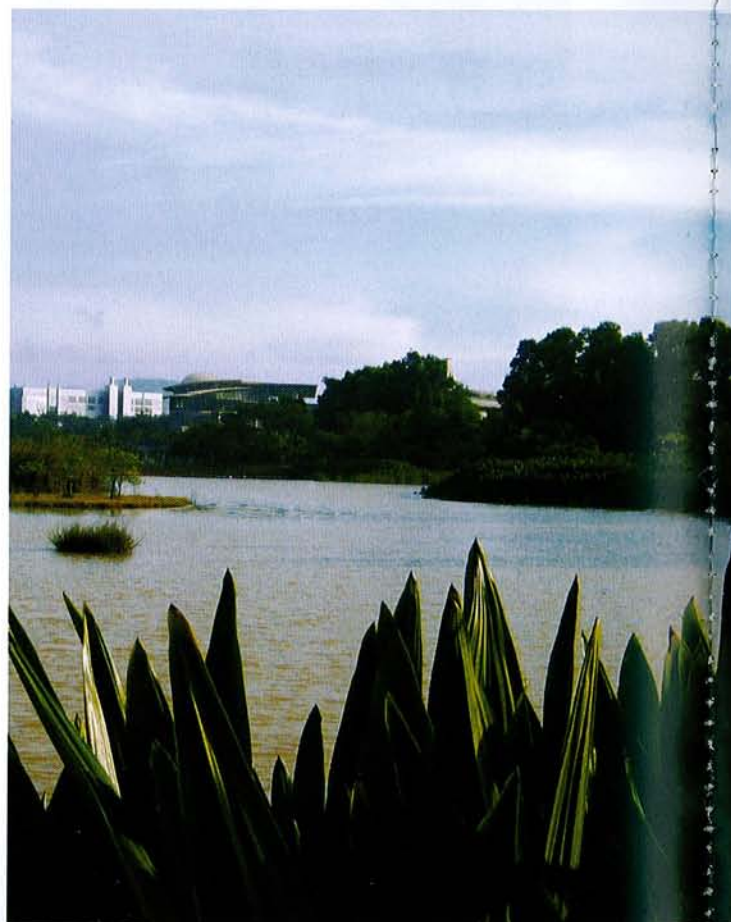


ACS's specialisations meant that the company was entrusted with many prominent projects. But it was the relatively short duration taken by ACS to ameliorate the infamous water crisis in Malacca back in 1991 that earned the company its first ACEM engineering award.

"We responded to the distress call well, and originated the concept of a banded storage and water transfer scheme. The project took only seven months to concurrently design, procure and build. It accelerated the recovery of the Durian Tunggal reservoir which dried-up," said Khor. Now, aside from hands-on projects, ACS also sits on panels that are given the task to review the designs of public and private projects funded by banks.

ACS's unique signature in every project is that "All our projects link back to nature," Khor explains, "Our vision is to give life back to the waterways, to nature. That is why we built our capability along water sources and that is our edge." This simple vision reinforces many of the company's goals, one of which is to offer services to developing countries. So, ACS never limits its services to Malaysian shores.

The company's overseas ambitions are reflected by a profile of projects in neighbouring ASEAN countries such as Indonesia, Brunei, the Philippines, Laos and Vietnam, plus other Asian countries like China and Pakistan. "We felt that there is a need to source for overseas projects because there are too many consulting firms in Malaysia. There is a definite interest in ASEAN countries especially



PHOTOS ANTI-CLOCKWISE FROM THE LEFT:

#### **SG TEKEK IN TIOMAN**

ACS prepared design and supervised the construction works to restore the Teluk Tekek beach to a high standard recreational beach in Pulau Tioman which is dubbed one of the 10 most beautiful islands in the world. This includes hydraulic study, design of coastal structures, beach nourishment and river rehabilitation works. The total project cost is approximately RM130 million.

#### **PUTRAJAYA WETLAND AND LAKE**

The Putrajaya Wetland, one of the world's largest constructed wetland with 197 hectares and the Putrajaya lake, 400 hectares is another prestigious project undertaken by ACS. This environmental friendly project built in the urban centre of Putrajaya creates an environment conducive for people to live, work and play.

#### **PIPELINE AT LAHAR TIANG**

Twin 2500mm diameter pipelines for transfer of water from Sg. Muda to Sg. Dua canal under the Muda river Water Scheme Phase 4A, Penang. The project involves upgrading a 14km water conveyance canal, two new pumping stations and a water treatment plant. The upgraded scheme at Sg. Dua supplies 80 per cent of Penang's population.

Vietnam, India, Indonesia, Myanmar and so on. They are big countries with big markets and it is worth it." says Khor. But ACS always returns to the best in its local portfolio as a hook when bidding for foreign projects.

For a start, this Malaysian firm has quite a few advantages over other foreign firms, especially those from the West. As Khor highlights, "Developing countries need not necessarily look to Western firms. Malaysian firms are more familiar with Asian geography, and environmental, social and political conditions, and would have more relevant experience, especially in Asian and ASEAN countries. For ACS, we believe that our expertise and standards in certain core areas are on par with developed countries. For instance, we introduced a new stormwater management system using constructed wetlands and gross pollutant traps in Putrajaya which help to control flooding and improve water quality. This environmentally friendly solution formed an integral part of Putrajaya to create a city of gardens and water where people want to live, work and play," shares Khor.

With this expertise and high standards in place for so many years, the company's flag is now flying high in Asia. "As a developing nation, Malaysia is ahead of her neighbours in terms of water resources development and management," states Khor, "we are moving towards Integrated Water Resources Management (IWRM) which includes regulations to fine polluters of water resources (polluter pay principle), incentives for recycling water, optimum use of water resources to meet various demand sectors, land use planning and management to reduce the impact of development on the water source."

A move towards more regulated management of waterways and water source, IWRM also looks into ways to upgrade existing water sources, promotes the conjunctive use of surface and ground water and water demand management to reduce water consumption.



“The developing countries are experiencing similar problems of water shortage and degradation of the water resources due to pollution of the environment. Our experience in tackling these problems is relevant and can contribute positively to these countries,” Khor points out. Of course, another significant advantage ACS has over bigger, reputable Western firms is cost – an advantage conferred by the exchange rate and geographical proximity.

But there are still challenges. For the World Bank-funded urban upgrading works in Vietnam, ACS hit a bump when it was revealed that no as-built drawings for existing utilities of the sites were available, meaning that all work had to start from scratch. Comprehensive information gathering efforts took place to cover the sites from the air, on land and underground. Besides that, the consultant had to deal with cultural differences such as the language barrier and gaining trust, all while adapting to a different set of design standards and codes. On top of all that, extensive stake holders dialogue had to be conducted for the resettlement of people affected by the project.

Be it local or foreign ventures, reviving the life of abandoned ore mines or dealing with cold, lifeless concrete, everything has a beginning.

“Starting out in this business was a slow process. First, you need to know where your expertise lies. You will need time to develop the consultancy business. If you’re on your own, you should start small within a specialised field and form consortiums with firms that can cover a combination of disciplines to synergise with your efforts,” advises Khor. Opportunities are definitely aplenty in this field and the means to tap these opportunities are abundant as well. Angkasa Consulting Services Sdn. Bhd. has made and earned these opportunities the long and hard way. But after 31 years, the firm’s stature in the consulting world means that its efforts have been worthwhile. ■

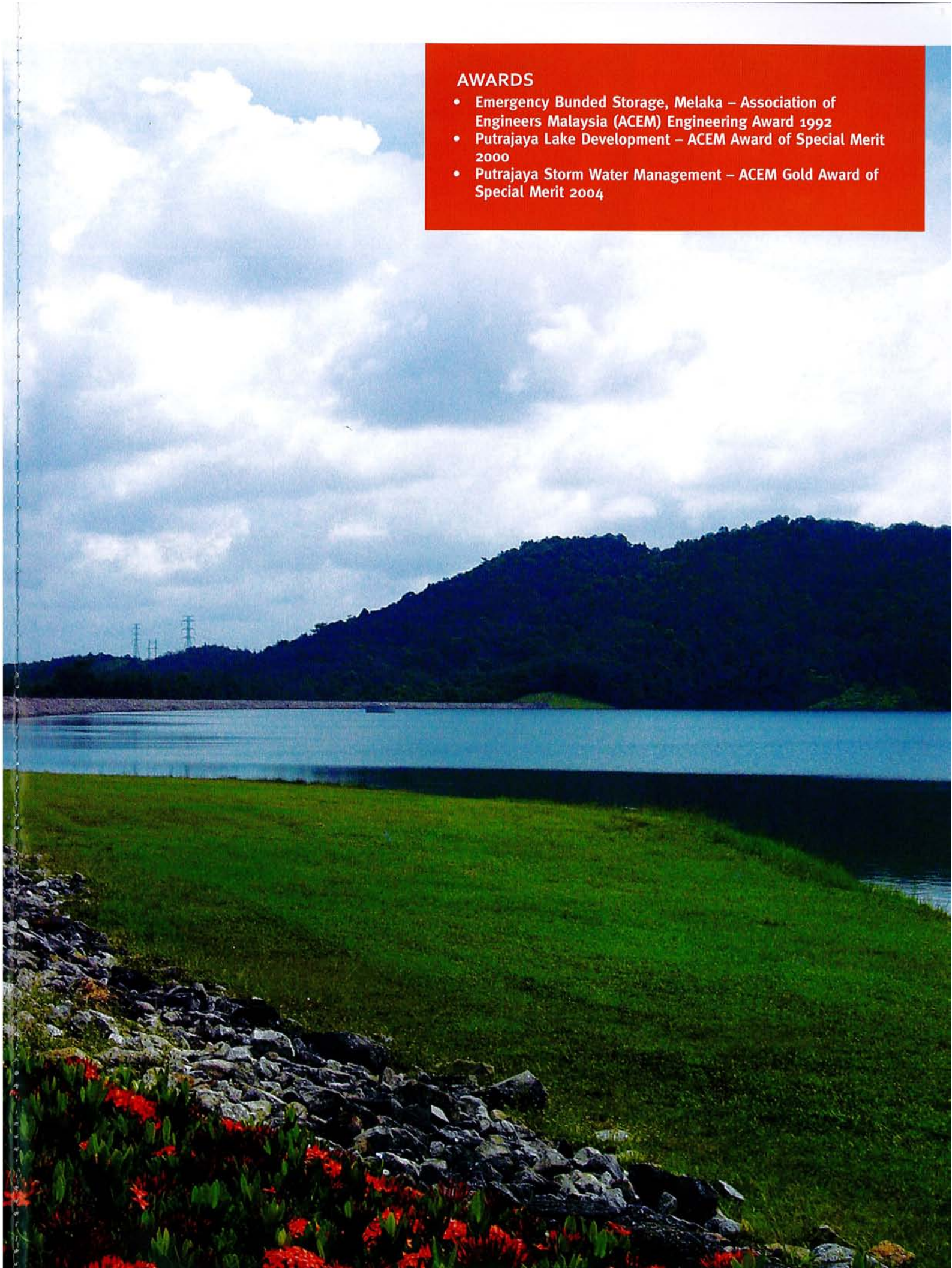
#### MENGGUANG DAM

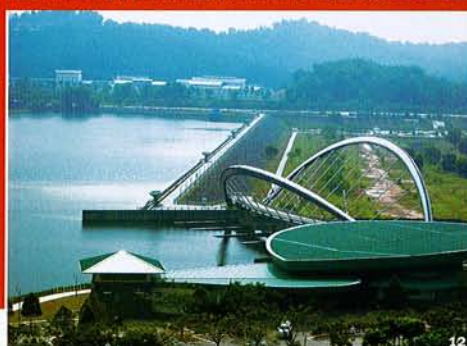
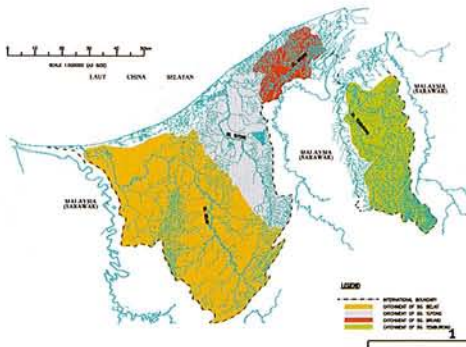
By 2020, the population of Penang is projected to hit 1.73 million and the Mengkuang Dam was built to meet the island state’s water requirements then. It now supplies raw water to Sungai Dua water treatment plant that is already quenching 80 percent of Penang’s potable water requirement. With the construction of a new dam nearby as part of the Mengkuang Dam Expansion Project, which began in October 2009, this existing dam will be heightened and merged into a single dam with an overall length of 3km, increasing storage capacity from 23 million to 78 million cubic metres of water. The environmental backdrop of the dam is in line with ACS’s concept of ‘green culture’ that involves environmental planning and project design with environmental consideration.



## AWARDS

- Emergency Bunded Storage, Melaka – Association of Engineers Malaysia (ACEM) Engineering Award 1992
- Putrajaya Lake Development – ACEM Award of Special Merit 2000
- Putrajaya Storm Water Management – ACEM Gold Award of Special Merit 2004





**SOME OF THE MANY WATER PROJECTS THAT ANGKASA CONSULTING SERVICES SDN. BHD. HAS WORKED ON:**

1. Brunei National Water Resources Study
2. Concrete Chute diverting flows from Melaka River into the Bunded Storage, Melaka.
3. Water Treatment Plant at Hilir Perak.
4. Upgrading of Bk. Sebukor Water Treatment Plant, Melaka using Stainless Steel Lamella Plate Sedimentation Process.
5. Damansara Sewerage Pumping Station, Damansara, Selangor.
6. Coastal area of Penang – studied under the Integrated Shoreline Management Plan Study, Penang.
7. Breakwater at Teluk Tekek Beach Rehabilitation Works, Pulau Tioman, Pahang.
8. Installation of Gross Pollutant Trap for Putrajaya Stormwater Management System, Putrajaya, Federal Territory.
9. Constructed Wetlands at Putrajaya, Federal Territory.
10. Putrajaya Lake and Wetland System, Putrajaya.
11. Water Overspilling from Sg. Kinta Dam, Ipoh, Perak – the first Roller Compacted Concrete in Malaysia.
12. Putrajaya Main Dam at Putrajaya, Federal Territory.
13. Ulu Belait Dam Project, Brunei–Topography near Ulu Belait Damsite.
14. Drainage improvement works, Ho Chi Minh City, Vietnam.
15. Hydropower Dam Site at Rajdhani Hydropower Project, Pakistan.

“All our projects link back to nature. Our vision is to give life back to the waterways, to nature.” – Khor Chai Huat



**PROJECT BEKALAN AIR BARU MELAKA PERINGKAT 2 – NEW BERTAM WATER TREATMENT PLANT**

Arguably the biggest water supply project in the 1990s implemented by Perbadanan Air Melaka and costing RM110 million, this 120 Mld capacity plant was built alongside 59 kilometres of water transmission mains and the construction of five storage reservoirs to form the backbone of Melaka's water supply system. As seen above, this plant holds a Dissolved Air Flotation System (DAF) that acts as an alternative to conventional treatment and is most effective when severe algae blooms occur on a regular basis.

**ANGKASA CONSULTING SERVICES SDN. BHD.  
DIRECTORS**

**KHOR CHAI HUAT**

• *Managing Director*

A Master of Engineering from the University of Auckland, New Zealand, Khor has over 30 years experience in multi-disciplinary engineering works in his career as an engineering consultant. His main areas of interest and expertise are water resources planning, dam engineering and stormwater management. He was an ex-council member of both the Malaysian Water Association (MWA) and Association of Consulting Engineers Malaysia (ACEM). Currently, he is the leader for the Ho Chi Minh City Urban Upgrading Project (SP5 and 6).

**LEE SEK CHONG**

• *Director and Head of Water Supply Division*

Since graduating with a Bachelor of Engineering with Honours from Canterbury University, New Zealand, Lee has garnered 28 years engineering experience involving 30 water-related projects across no less than 10 Asian countries including Malaysia. His Midas Touch led the firm to achieve various accolades for such projects as the fast track Durian Tunggal Pumped Storage Scheme in the early 90s and the more recent Putrajaya Stormwater Management Project.

**MOHAMED ARIFF BIN AWANG**

• *Director and Head of Electrical Engineering Division*

A registered engineer with a Bachelor of Science in Electrical Engineering, Mohamed Ariff has more than 20 years experience in the design, construction supervision and contract administration of major infrastructure works involving electrical works. He now oversees approval permits for import and manufacture of electrical goods (control items) in Malaysia and preparation of safety guidelines for consumers. He also conducts safety talks for the public.

**CHANG CHAN YANG**

• *Director and Head of Infrastructure Division*

With 25 years of experience in the field of water resources, water supply, stormwater, hydraulics and wastewater projects, Chang ventured into the consultancy sector after serving the public sector for five years where he continued to be involved with water resources, water supply, stormwater design and other related water fields such as dam and wastewater. He is currently the Project Manager for the Integrated Shoreline Management Plan for Penang. Chang also holds a Bachelor in Civil Engineering (Hons) from the University of Melbourne and is a registered Professional Engineer.

**DR. LIM FOO HUAT**

• *Director and Head of Maritime & Coastal Engineering Division*

Having earned his Masters of Engineering and Doctorate from Nanyang Technological in 1995 and 1998 respectively, Dr. Lim now specialises in hydrology, hydraulics, water resources and coastal engineering. His experience in dam hydraulic and water resources studies includes the Sungai Kinta Dam, Sungai Kelalong Dam, Mengkuang Dam, Brunei Water Demand and Resources Study, Bakun Hydroelectric Project and Nam Sane 3 Hydropower Project. He also designs all coastal projects undertaken by the company, which includes breakwaters, revetment, dykes and the like.

**CONTACT**

**Angkasa Consulting Services Sdn. Bhd.**

No. 49, Jalan USJ 10/1A,  
47620 UEP Subang Jaya,  
Selangor Darul Ehsan,  
Malaysia.

Tel: +603 5632 8899

Fax: +603 5632 8833

Email: [acs@acssb.com.my](mailto:acs@acssb.com.my)