

Arabian nights are hot!
The situation of civil engineering in the Mideast/Persian Gulf region
Moving away from oil dependence

1. Development of Dubai and the situation of civil engineering

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The hot season has arrived. Here in Dubai, situated in a dry subtropical region, the temperature soars as soon as June comes into view. On a manmade island site, filled in with sand, the temperature has already risen past 50°C. In Dubai, a city covered by asphalt and concrete with just a tiny amount of manmade greenery, the daytime temperature also gets close to 40°C. Of Dubai's total population of 1.3 million (estimated), it is said that only about 10% are citizens, while most are foreign residents from India, Pakistan, Iran, and elsewhere. I will report on the situation of Dubai's rapid development from the standpoint of a civil engineer here in Dubai, where I have been working for about a year and a half.

Why Dubai?

Dubai, the second emirate of the United Arab Emirates (UAE), is one of the world's most rapidly developing cities. Earlier this year, the world recognized the economic power of Dubai when Dubai Ports World, a port management company owned by the government of Dubai, purchased the Peninsular and Oriental Steam Navigation Company (P&O) of the United Kingdom, an incident whose repercussions extended to the U.S. The government is leading a successful national strategy to move away from oil dependence, promoting free economic activities to attract people, goods, and money from around the

world. I found a photograph on the Internet that illustrates Dubai's transformation (Photograph 1). The impression is that of a desert oasis which has been completely transformed overnight.



Photograph 1. The changing cityscape along Sheikh Zayed Road, a main thoroughfare (from the Internet).

Situation of development in Dubai

Vast sums are being invested in Dubai, including forests of high-rise office buildings and apartment buildings (Photograph 2), incredibly large manmade island projects, a project to expand the Middle East's international hub airport served by Emirates Airline (see Column 3), and development of a shipping hub with an advantageous location in the Persian Gulf region. In addition, Dubai is continuing its vigorous development of tourism facilities including an enormous shopping mall, an indoor ski resort, and theme parks.

Anywhere one goes in Dubai, there are billboards and banners of two major development firms: Emaar (<http://www.emaar.com>) and Nakheel (<http://nakheel.com>). Emaar's real estate

development projects include Burj Dubai, which will be the world's tallest building (see cover story 2), as well as residential and office buildings, Dubai Marina, and The Greens Dubai. Nakheel is engaged in waterfront development based on large-scale land reclamation in the Persian Gulf (see cover story 1). The development budget is said to be over ¥3 trillion, a massive undertaking which will give Dubai an additional 1,500 kilometers of coastline.



Photograph 2. A high-rise apartment building under construction at the Dubai Marina (photographed from the roof of our lodgings).

Civil engineering in Dubai

Civil engineering in Dubai encompasses practically all of the construction methods used in Japan. As stated in *CE Report*, construction in Dubai has employed monorail and other railway technologies developed in Japan, along with supporting technologies such as civil engineering foundational technologies and shield tunneling methods. Other technologies that have already been employed in construction projects here include ground survey techniques such as cone penetrometer technology (CPT), methods for diaphragm walls and continuous column diaphragm walls, earth anchor based earth retaining technologies, prestressed concrete bridges, civil engineering technologies for ocean dredging in manmade island reclamation projects, and vibrocompaction methods. Many design consulting firms from all over the world are

active in Dubai, and design technologies based on the British Standards (BS) are prevalent. Construction permits are under strict government control, and a great deal of time and effort is needed in order to obtain a construction permit. It is particularly difficult to obtain a No Objection Certificate (NOC) from the related government ministries and agencies. There is an integrated system in place for the entire process from design and construction to permits and licensing.

Labor situation

There are not many large local construction firms employing at least 10,000 workers. Therefore, it is difficult to get them to commit to subcontractor agreements that are suited to our budgets. In an economic boom, the demand for construction creates a seller's market, and construction costs have been rising rapidly for the past several years. Meanwhile, the large local construction firms are also facing some problems. These include labor disputes, since they rely on foreign construction workers from countries such as India, Pakistan, and Bangladesh. At the construction site of Burj Dubai, unhappy with their low wages, foreign workers rioted and caused over ¥100 million in damage. There were further strikes to demand better conditions, and the authorities were forced to intervene. The strain of using cheap labor to implement construction projects is beginning to make its effects known.

The intense heat of July and August, when the temperature rises above 40°C and humidity is near 100%, creates brutal conditions for construction workers. Since last year, the Ministry of Labor has decreed that workers must be allowed to rest in the shade during the period of time when the temperature is hottest. This year, the midday rest time is from 12:30 to 3:00 PM. Companies that violate this rule are publicly penalized. There are also strict

regulations concerning environment, health, and safety (EHS) which must be observed in construction projects.

Leisure

One popular way to spend leisure time in Dubai is to attend events such as the Dubai Tennis Championships, the Dubai Desert Classic golf tournament, the Dubai World Cup horse race, jazz concerts, or the Formula One Grand Prix in neighboring Bahrain (Photograph 3). There is a wide range of leisure options, including the beach, marine sports, golf, tennis, and relaxing at resort hotels. Golf is popular from November to April, when temperatures are mild. There are many new or upgraded golf courses (Photograph 4). On the weekends, many enthusiasts from the Japanese Association get together to play golf or tennis. There are many ardent soccer fans, and pubs are busily preparing for the upcoming World Cup. For us as well, that will be a time to get away from our work and relax for awhile. Hang in there, Japan!



Photograph 3. The opening race of the Formula One Grand Prix, part of the Bahrain International Circuit in the desert.



Photograph 4. Expansion is proceeding rapidly at the Emirates Golf Club. Buildings lining the Dubai Marina appear in the background.