CS-242

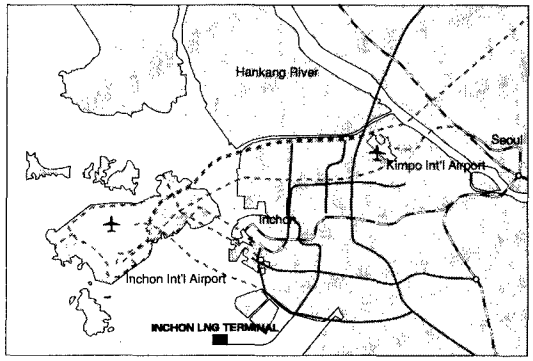
INCHON LNG 200,000KL INGROUND TANK PROJECT
Design and Technical Advising Service

Taisei Corporation Member Masanori Yokoyama
Taisei Corporation Member Toru Shimizu

1. Outline of the Project

In Korea, LNG tanks have been constructed by the conventional above ground type. Korea Gas Corporation (KOGAS) has decided to build **inground LNG tanks** at Inchon for the first time in Korea for the merits of efficient use of land and environmental viewpoints. It was a bidding requirement that Korean contractors had to get technical cooperation from experienced foreign companies because a high integrated technology was essential. Taisei was requested by Samsung Corp. to work together for bidding and execution of the project when Samsung Corp. became a successful bidder.

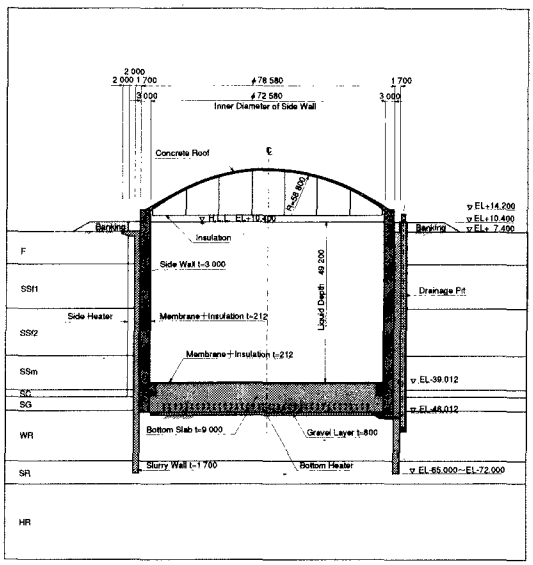
Fig.1 Site Location



Project Description

Samsung was awarded the contract as follows.
Contract: Lump Sum, design and construction
Contract Period: 1998.10-2002.7 (46 months)
Inner diameter: 72.58m
Liquid depth: 49.2m
Thickness of bottom slab: 9m
Thickness of sidewall: 3m
Slurry wall depth: 65～72m
Volume of concrete: 150,000m^3

Fig.2 Structural Section



2. Taisei's Contract & Scope of Service

As for Taisei's contract formation, ①joint operation, ②construction management and ③ technical collaboration were selective options. Among them technical collaboration to provide design and technical advisory service was selected because there was no

Key word: Korea, LNG inground tank, design service, technical advice, contract
Address: Nishishinnjuku1-25-1, Shinjuku-ku, Tokyo 163-0606 TEL:03-5381-5337 FAX:03-3348-7120

time to register as a construction contractor in Korea and there were lots of risks as a contractor.

Therefore Taisei made a contract with Samsung that Taisei would work as a designer and a technical adviser.

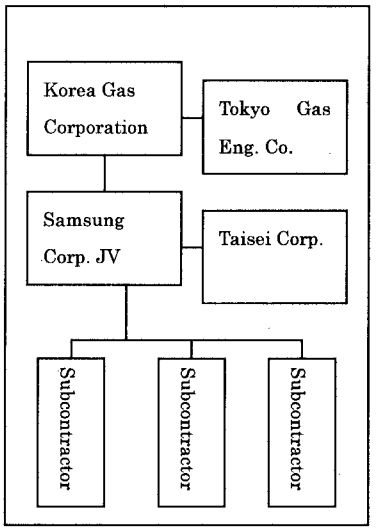
Taisei's scope of service is as follows;

(1) Design Service at Bidding Stage: Preparation of technical proposals, such as basic structural design, mechanical and instrumental design, schedule and execution plan.

(2) Detail Design: Design calculation, design documentation, design drawings, inspection standards, such as embedding length of slurry wall, monitoring plans by measurement instruments, etc.

(3) Technical Advising Service: Giving advice to all technical matters, such as concrete mix design, trial mix by the actual plant, method of construction, selection of construction plant and equipment, schedule, quality control, etc. (4 to 7 numbers of engineers)

Fig. 3 Contract Formation



3. Features of Contract and Technical Service

The following measures were taken after careful consideration to minimize future troubles and lead to a successful execution of the project.

(1) Adapt design which matches Korean construction practice and technology.
(2) Train Samsung's engineers at a similar job site in Japan.
(3) Define the scope of services as clear as possible.
(4) Insure professional indemnity liability for design service.
(5) Minimize the responsibility of technical advising service.
(6) Increase the number of technical advisers more than required by the Specification.

4. Summary

In overseas projects it is quite important to check the capability of local contractors, construction business regulations, country risks, etc. and to select the best contract type which has less risks.

We would like to perform design and technical services more in the future. To achieve this, it is "a must" to have superior technologies and management capability which are useful, effective and adaptable in other countries.

Fig.4 Design and Construction Schedule