

Wakayama Marine City Project in Wakanoura Bay—Utilization of the Coastal Zone through Construction of Artificial Island

TATSUYUKI-SHISHIDO

Ports and Harbors Division, Civil Engineering Department, Wakayama Prefectural Government, 1-1 Komatsubara, Wakayama, 640 Japan

Wakayama Prefecture, located in the southwestern part of Kii Peninsula of Japan Proper, is backed by the Kyoto-Osaka-Kobe District. Known from the ancient times by the name of Kinokuni (Province of Kii), the prefecture is occupied for the most part by mountains and has a limited plain land area, but flatland predominates in the Kinokawa River basin.

In the central part of Wakayama-Shimotsu Port situated at the mouth of the river lies Wakanoura Bay opened westward and stretching about 4.5 km north to south and east to west, respectively. The bay is blessed with good natural coasts and beaches presenting varied picturesque scenery. The well-developed coasts provide fishery ports, man-made beaches, tourist inns, sea side promenades and other amenities for the tourist public.

The bay and its surrounding area, which used to be a favorite locality for poets of the Nara and Heian eras, abounds in spots of historical and cultural interest. And in the area, one can find traditional Japanese industries, such as lacquerware and umbrellas, and a variety of marine sports or recreational activities. Thus the area is full of tourist attractions and offers great possibilities as a marine resort.

The Wakayama Prefectural Government's Long-range Development Plan designates development of Wakanoura bay as marine recreation resort. The plan expects that the value of the environment and resources of the bay area will be further enhanced as a result of the inauguration of the Kansai International Airport, scheduled for opening in 1993, and will assist development of the Wakanoura Bay area to cope with the growing needs for cultural and human communication and meet the requirements of the resort age.

Against this background, the Wakayama Marina City project has been planned for the Wakanoura Bay area to create an international urban resort complex.

1. Procedure

The project has been promoted through the concerted development efforts of the Wakayama Prefectural Government and Matsushita Investment and Development Co., Ltd., a private firm closely associated with the prefecture. A preliminary study of the possibility of coastal resort development in Wakayama-shimotsu Port was undertaken by the the Ministry of Transport, the Wakayama Prefectural Government, and the Wakayama City Office in 1987 fiscal year. This was followed by a series of comprehensive technical discussions and deliberations by an ad hoc study committee composed of scholars, experts in related disciplines and local interests.

In consequence, the Wakayama Marina City plan was officially approved in November 1987 as a part of the Development Plan of Wakayama-Shimotsu Port under the Ports and Harbors Law. A reclamation permit was granted for the project in January 1989 under the public Water Surface Reclamation Law.

The construction stage was started in April 1989, and offshore works, road and bridge construction, and other works are currently under way.

2. Outline of Project

2-1 Goals of Wakayama Marine City

The Wakayama Marina City has a basic strategy of stimulating economic revitalization of the local communities, contributing toward the growth of local industries and achieving the industrial restructuring of the Prefecture as a whole. Its more specific goals are as follows:

Creation of a Marine Resort Complex

Creating a marine international resort complex in the vicinity of the urban area which will comprise a marina and other sports facilities, housing, accommodations for tourists and holidaymakers, commercial establishments, and other amenities to found a new recreational community which will be enjoyable to both the young and the old alike.

Promotion of Economic Revitalization of the Prefecture

Facilitating the permanent settlement of young people in the prefecture and the inflow of young worker into it through the provision of sports and recreational facilities and urban amenities for the proposed Wakayama Marina City and introduction of quality service industries, thereby eventually establishing solid economic foundations of the Prefecture and furthering its economic revitalization.

Contribution toward Prefectural Culture and Its Enhancement

Furtherance of cultural exchanges and activities in the Prefecture through the introduction of its traditions, culture and history and the provision of additional convention, information and cultural facilities, thus contributing toward the enhancement of the cultural level of the prefecture.

Creation of a Major Sports Center

Developing the new Wakayama Marina City as a major sports center of the Prefecture by providing a large marina and a variety of other sports facilities to promote the use by youth from neighboring major cities as well as regional population.

Creation of "Family Land" and Restfull Environment

Creating a "family land" centering around the resort complex to cater for the amenity of families and other segments of the prefectural population as well as visitors from other areas and providing a restfull environment for these people, thereby encouraging the permanent settlement of regional residents in adjacent areas.

2-2 Project Size and Utilization plan

The proposed Wakayama Marina City will have a total area of 65 hectares, of which 49 hectares will be reclaimed by filling up an offshore area to form a man-made island. The sea area about 150 m wide sandwiched between the man-made island and the existing shoreline will be integrated with natural shorelines and the island shorelines to create a unique recreation-oriented space.

The proposed marina, which will form the core of the man-made island, will be capable of accommodating nearly 1,000 yachts and other pleasure boats and will constitute part of the marine resort complex consisting primarily of sports facilities, fishermen's wharf, commercial establishments, accommodations for tourist and holidaymakers, and other amenities. It is planned that the resort complex will have three million visitors annually and that a part of the island is for 4,000 permanent residents.

The man-made island will be linked to the existing city area by two access bridges, one 410 m long and the other 280 m long. It is also planned to build a north and a south breakwater with a combined length of 920 m to shelter the marina, passenger boat wharf, marina basin and other harbor facilities.

The man-made island will consist of the following developments:

- Approximately 39.3 hectares for recreational facilities featuring the scenic natural environment of Wakayama Bay ;
- 3.2 hectares for construction of a wharf providing direct access to the Kansai International Airport currently under construction and which is expected to contribute toward promoting fisheries and other local industries ;
- 2.3 hectares for facilities dedicated to international cultural exchanges in an effort to keep abreast of the trend toward internationalization of the various aspects of national life ;
- 1.2 hectares for park construction with a view to giving landscaping effects to the man-made island and providing a restful environment for visitors ; and
- 2.9 hectares for road construction.

The planned recreational complex, accounting for approximately 80% of the artificial island, will comprise a marina, residential area, accommodation for sightseers and holidaymakers, sports and cultural facilities, and commercial establishments, making best use of the characteristic surrounded by sea.

The wharf area will include a fishermen's wharf, a major attractive facility in the island. The facilities dedicated to disseminating the prefecture's cultural traditions and contributing toward international cultural exchanges are planned for the area set aside for this purpose.

Nearly 20% of the man-made island will be covered with green foliage so as to contribute toward harmony with the surrounding natural environment.

3. Environmental Considerations

In planning the Wakayama Marina City Project, environmental impact assessments using simulation models and other methods were undertaken at the various stages

of the project development on the basis of field surveys and in-depth reviews of relevant data and literature. The studies covered a wide range of subjects: air pollution, water quality, currents, bottom material, noise, vibration, bad smells, ecosystems, fisheries, landscaping, cultural property, recreation, etc. In consequence, it was the conclusion of the overall impact assessment that the project will produce only minor impacts on the natural environment of the project area.

Wakayama-Shimotsu Port is situated in sea areas which are governed by the Law concerning Special Measures for Conservation of the Environment of the Seto Inland Sea.

Therefore the plan was also examined from the viewpoint of the guideline under the Law. As a result, it is concluded that the influence will be minor.

Under the Public-owned Water Surface reclamation Law, an environmental impact assessment performed also indicated that the project will produce only negligible environmental impacts in terms of air pollution, water quality, noise, vibration, bad smells, topography, terrigenous life, plant, aquatic life, landscaping, and outdoor recreations.

Monitoring is being performed during the execution of the construction works to prevent environmental disruption in the project area.

4. Utilization of waterfront

The Wakayama Marina City featuring an offshore man-made island is characterized by the concept of achieving the maximum possible development and utilization of the potentials of the sea and waterfront areas involved.

The island type Wakayama Marina City is planned to be surrounded by sea on all sides, in addition to two waterways planned in island. Thus, the reclaimed island will have nearly 8,400 m of shoreline with the construction of about 500 m of mooring facilities for sightseeing ships, about 900 m of revetment for the marina, about 250 m of revetment the park, and about 1,400 m of revetment for the two waterways is planned. And other parts of the revetment are also designed, or under consideration.

The waterways, for example, will be built of stone steps to provide visitors with easy access to the water channel leading to the sea. The revetments are designed hydrophilically to allow visitors to enjoy a stroll while enjoying a magnificent view of sea.

The proposed marina is designed so as to serve not only as moorings for yachts and other pleasure boats but also as waterfront spaces for shopping, strolling and other leisure time activities. The fishermen's wharf planned for the wharf area will afford opportunities for closer contacts between humans and the sea.

In addition, the two proposed breakwaters with a total length of 920 m fronting the Wakayama Marina City has been designed, using the method of computer graphics, as the first trial for the breakwater with amenity. Distinct from conventional breakwaters whose primary functions are to shelter harbor basins and

navigable waterways against waves, the breakwaters planned for the Wakayama Marina City are intended to perform the additional functions of permitting visitors unobstructed and safe access to the resort complex and safeguarding their recreational activities in its offshore areas. In the proposed breakwaters, the superstructures are designed to provide adequate spaces accessible to visitors and protect them from exposure to direct sunshine and splashes from waves. The design also makes provision for small boats.

Planned for the coastline running along the access road connecting the existing city area to the man-made island are stepped revetments, promenades and other waterfront facilities which will be conducive to the enhancement of the environmental value of the Wakanoura Bay area.

Concluding Remarks

In the present project whose construction stage was started in April 1989, the reclamation works for the man-made island are being executed in two stages. The first section is scheduled for completion in 1992 and the second section in 1994. Construction of the breakwaters, bridges and other structures has been going on and is scheduled to be completed in time for the completion of the reclamation works.

The breakwaters with their amenities are being built by the 3rd District Port Construction Bureau, Ministry of Transport. Wharves, bridges, roads, facilities for amenities and the reclamation are under the control of the Wakayama Prefectural Government.

A part of the recreation complex site is being prepared under the control of Wakayama Marina City Co., Ltd., a specially established public private sector entity, as the first offshore man-made island project under the Coastal Space Creation Undertaking Program initiated by the Ministry of Transport in fiscal 1988.

Overall, the Wakayama Marina City Project has been promoted by the concerted development efforts of the central and prefectural governments and the public-private sector joint venture for creation of an international urban resort complex island in harmony with the surrounding sea.

Fig.1 Wakanoura Bay

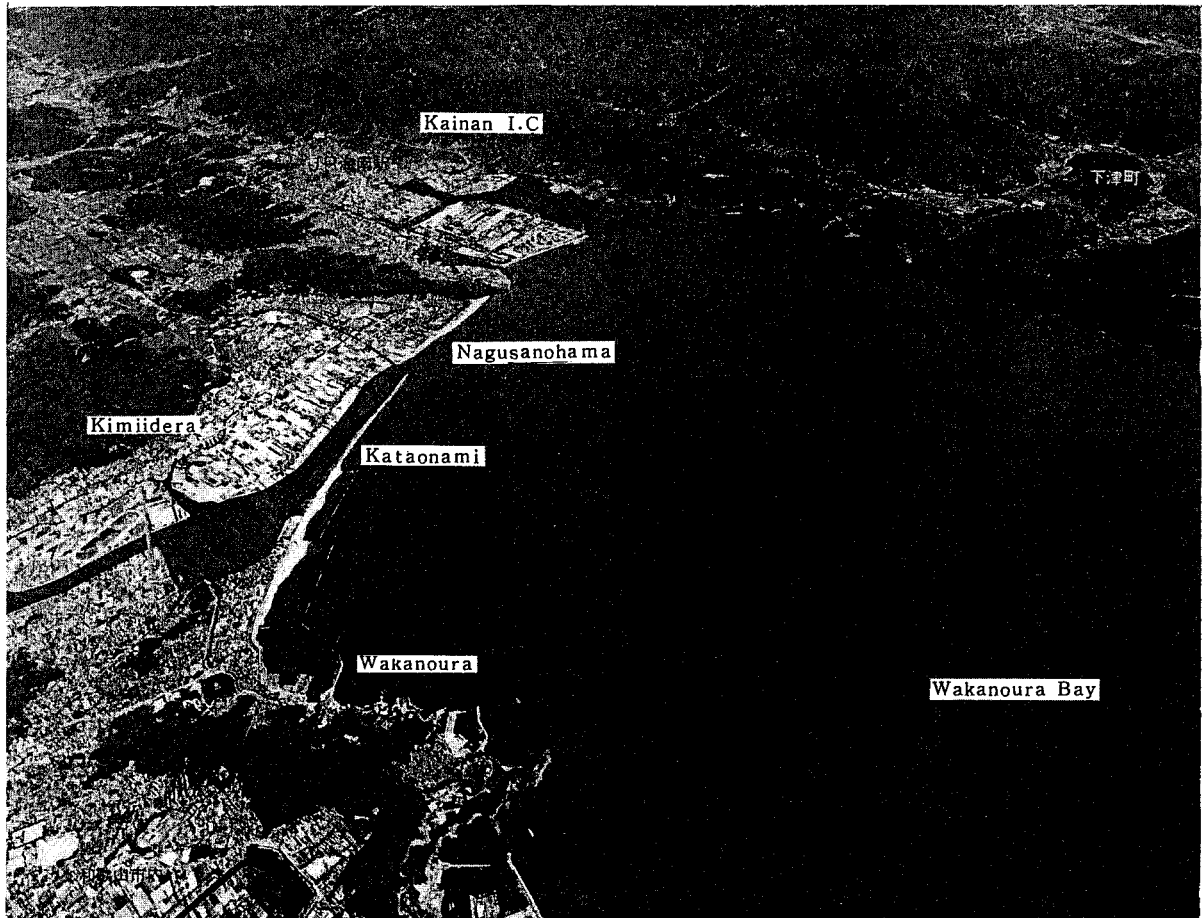


Fig.2 Port planning of Wakayama Marina City

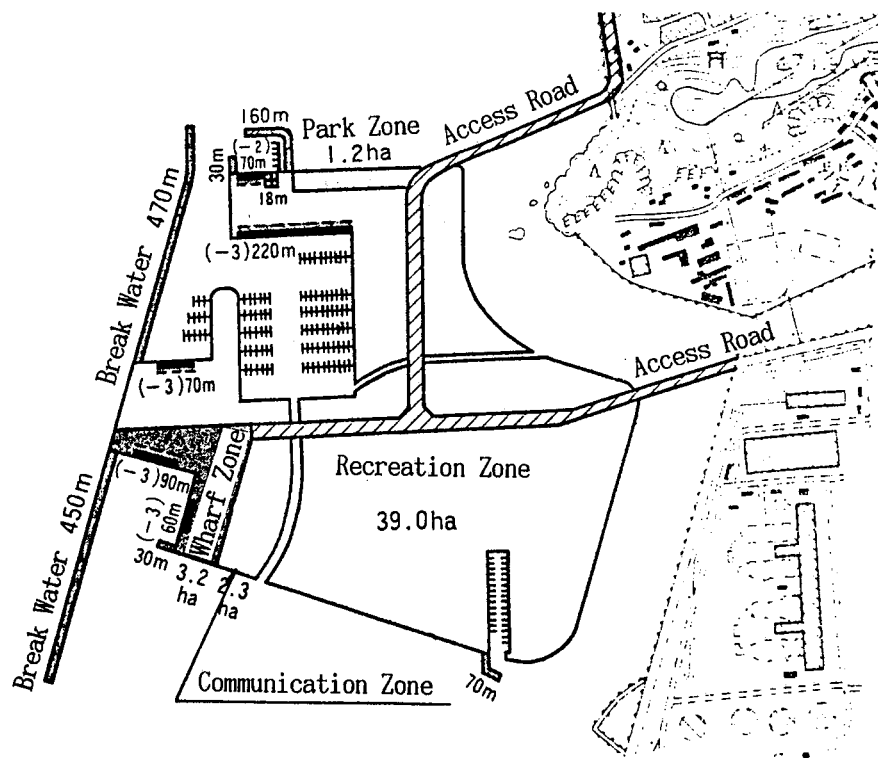


Fig.3 Image Perspective drawing of Wakayama Marina City

