

Collection of summaries of WAVE studies and research

(Fiscal 1997)

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Waterfront Vitalization and Environment Research Center

## Studies and Research Department

### Study for waterfront vitalization

Study	Fiscal year when study was conducted	Study outline
Study for Noshiro Port Redevelopment (First District Port Construction Bureau, Ministry of Transport; Akita prefectural government and Noshiro municipal government)	1997	The Shimohama and Nakajima areas in Noshiro Port had been used increasingly poorly with the use of larger ships. With growing local public interest in waterfront, the development of these areas into a "lively space crowded with people" was required. Then, highly feasible facilities development plans were prepared incorporating the construction of a boat park.

## Studies for developing a long-term vision of wide-area development

Study	Fiscal year when study was conducted	Study outline
<p>Study for planning the wide-area cooperative development of central and southern Akita and Iwate areas (Second District Port Construction Bureau, Ministry of Transport)</p>	<p>1996 } 1997</p>	<p>Wide-area cooperative development plans and implementation policy were proposed, and implementation programs were prepared focusing on domestic and international physical distribution (sharing of port functions and construction of an inland depot), sight-seeing and recreation (development of sight-seeing routes and camp sites) and daily public exchanges (reinforcement of public transit systems), based on the basic policy for wide-area cooperative development of central and southern Akita and Iwate areas (developed in fiscal 1996 studies).</p>
<p>Study for planning the reconstruction of Tokyo Bay coastal area (Second District Port Construction Bureau, Ministry of Transport)</p>	<p>1997 } 1998</p>	<p>As a two-year research in fiscal 1997 and 1998, studies are made of changes of trade and regional structures, improvement of physical distribution base and optimal position of environmentally friendly waterfront areas, and redevelopment of port functions, based on the functions and characteristics of ports in the bay defined in the "basic plan for Tokyo Bay port improvement". Plans are developed to improve port functions and make effective use of unused land. In the fiscal 1997 studies, the basic improvement policy was identified in view of the present status of Tokyo Bay waterfront area and the problems to be involved.</p>

### Basic study for developing port improvement plans

Study	Fiscal year when study was conducted	Study outline
Follow-up study on the Nagoya port basic improvement plan (Nagoya Port Authority)	1997	<p>A follow-up study was conducted on the Nagoya Port basic improvement plan developed in 1988 as guidelines for Nagoya Port development, from a viewpoint oriented toward the 21st century.</p> <p>As a result, it was reported that environmental changes around the port would not nullify the idea, objectives and direction of the existing plan and that the project plans and infrastructure development could adequately respond to environmental changes. It was suggested that port improvement should be continued and that more refined functions and higher quality space should be provided.</p>

## Feasibility studies for waterfront facilities improvement planning

Study	Fiscal year when study was conducted	Study outline
<p>Feasibility study for creating streetscape in the Takaramachi area in Kure Port (Government of Kure City, Hiroshima Prefecture)</p>	<p>1993 ) 1997</p>	<p>The Kure municipal government studied land use policy with the landfill in the Takara-cho area in fiscal 1993 studies. Then, the government conducted specific studies of various facilities for project implementation. In the 1997 studies, wide varieties of public opinions were invited on streetscape in relation to the basic plan based on the results of preceding studies. As a result, it was decided to develop a uniform modern design using bricks.</p>
<p>Study for Shimonoseki Port waterfront development (Government of Shimonoseki City, Yamaguchi Prefecture)</p>	<p>1997</p>	<p>A highly feasible development plan was prepared with a concept of creating a "theme park throughout the strait" in the waterfront area. The plan incorporates existing "Shimonoseki Port East Port area renaissance 21 plan", "Karato area waterfront development plan" and a plan for constructing an aquarium and a new Karato market that is being implemented with the ongoing landfilling work.</p>
<p>Study for preparing basic coastal area development plans in Narashino area in Chiba Port (Katsunan Port Construction Office, Chiba Prefecture)</p>	<p>1994 ) 1997</p>	<p>At the study site, the coastal line was separated from the hinterland by upright revetments as a result of landfilling that began in the late 1960s. With the improvement of disaster prevention level, public demand increased for the creation of space with greater accessibility to water. The government of Chiba Prefecture examined basic plans for creating artificial beaches in fiscal 1994 and 1995. In the studies of 1997, a committee including representatives of local residents had consultations as in fiscal 1996 and prepared plans for providing space mainly composed of beaches to meet the demand of the local community.</p>

<p>Study for constructing the <i>Marino</i> Bridge  Government of Kure City,  Hiroshima Prefecture</p>	<p>1995  }  1997</p>	<p>The Kure municipal government has a plan to develop the <i>Aga Marinopolis</i> area for regional exchange and communication as a hub of physical distribution in the Hiroshima Chuo <i>Technopolis</i> area, and for marine recreation activities; and to build the <i>Marino</i> Bridge to increase the efficiency of physical distribution and convenience. In the studies of fiscal 1997, a comparative study was made of bridge alignments not overpassing the small craft basin that was included in the phase-two landfill project, and of bridge construction methods and estimated construction costs for respective routes, based on the results of studies already conducted.</p>
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## Studies on projects related to physical distribution

Study	Fiscal year when study was conducted	Study outline
Study on Hososhima Port container terminal (Miyazaki prefectural government)	1997	In order to integrate a new container terminal with an existing adjacent container terminal in the Shirahama area of Hososhima Port, studies were made of cargoes handled, cargo handling equipment and yards, and a container terminal layout plan was developed.
Feasibility study on the Sakata Port international distribution terminal (First District Port Construction Bureau, Ministry of Transport; Sakata Port Construction Office; Yamagata prefectural government and Finance Department of Sakata municipal government)	1997	A 14-m quay is under construction in the outer port area of Sakata Port. A physical distribution hub will be built in the hinterland. Conditions of advanced physical distribution ports were investigated. Sakata Port, closest in Yamagata prefecture to the Sendai area, will be made a hub of Chinese trade based on the "eastbound Silk Road on the sea". Types of cargoes to be handled, shipping lines to be attracted and optimal characteristics of the physical distribution terminal equipped with refrigerated warehouses were proposed.

## Basic studies for developing port policy

Study	Fiscal year when study was conducted	Study outline
<p>Study for examining the waterfront recycling complex construction plans (First District Port Construction Bureau, Ministry of Transport)</p>	<p>1997</p>	<p>In the ports along the Sea of Japan under the jurisdiction of the First District Port Construction Bureau where numerous thermal power plants and LNG (liquefied natural gas) stations are located, investigations were made of the need, possibility and method of centralizing waterfront recycling-related industries. In the studies of fiscal 1997, a research committee was organized staffed with scholars, administrators (of the Ministry of International Trade and Industry and the Ministry of Transport) and members of 14 private companies to identify the present locations of recycling-related industries in the ports under study and the future directions of operation of administrative organizations and businesses concerned. Advanced models of recycling in various industries were checked in and out of Japan. Then, the feasibility of locating recycling complexes in respective ports was evaluated and recycling complex construction plans were developed based on case studies.</p>
<p>Study for using waterfront space (Ministry of Transport)</p>	<p>1997</p>	<p>In order to implement waterfront redevelopment projects smoothly, general procedures, study items, specific considerations and case studies of projects were organized, and measures required for implementing the projects were examined. The results were published by WAVE as "A waterfront redevelopment guidebook"</p>

<p>Basic study for using waterfront space (Ministry of Transport)</p>	<p>1997</p>	<p>The characteristics of manufacturing industries located in the vicinity of port (in waterfront area) were organized and analyzed and time-dependent changes in operation were identified to provide basic data for studying the future policy for using waterfront industrial space. Such leading parameters were used in the analysis as the number of offices, capital, number of employees and the amount of shipment available in industrial statistics in 1985 through 1995.</p>
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## Basic studies on physical distribution

Study	Fiscal year when study was conducted	Study outline
<p>Feasibility study for constructing a port in Okinawa for international distribution (Ministry of Transport and Okinawa General Bureau)</p>	<p>1997</p>	<p>The present condition and future direction of international physical distribution mainly in east Asia were identified, requirements as an international port for distribution were analyzed, feasibility of construction of an international port for distribution in Okinawa was studied, and the directions of port improvement and operation (e.g. facilities improvement for handling cargoes from Okinawa and transshipment cargoes, and reductions of transport costs through cooperation in cargo handling and integrated operation of terminals) were suggested.</p>
<p>Study on the impact of Kyushu expressway network on physical distribution through ports (Fourth District Port Construction Bureau, Ministry of Transport)</p>	<p>1996 } 1997</p>	<p>Analysis was made of the impact of the network of expressways in Kyushu, upon completion, and improved access to nodes in the Kyushu area on physical distribution through ports. As a result, it was revealed that goods currently concentrated in northern Kyushu would be distributed to local ports and that convenience would increase for local freighters</p>
<p>Study on the influence of a central international port in northern Kyushu on regional economy (Fourth District Port Construction Bureau, Ministry of Transport)</p>	<p>1997 } 1998</p>	<p>The influence of the building of a central international port in northern Kyushu on regional economy was analyzed, and economic conditions in the Port of Pusan and surrounding areas were identified to help enhance competitiveness against Pusan. In the studies of fiscal 1997, a comparison was made between ports in northern Kyushu and the Port of Pusan, and the possibility of creating feeder shipping lines was analyzed.</p>

<p>Study on changes of physical distribution due to deregulation (Second District Port Construction Bureau, Ministry of Transport)</p>	<p>1997</p>	<p>Changes of physical distribution through ports expected as a result of transport deregulation were identified to help improve ports in the future. A study was made on goods for domestic trade. Deregulation in the field of transport was grasped and changes that were expected due to deregulation were organized. Those involved in physical distribution were interviewed using the data obtained in the study and the impact on physical distribution was identified. As a result, the possibility of entry of freighters, shipping agents and warehousemen into port transport business and the possibility of shift of long-term transport to shipping were suggested</p>
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## Study for promoting digitalization in ports

Study	Fiscal year when study was conducted	Study outline
Study on Yokkaichi Port harbor information system (Yokkaichi Port Authority)	1997	In fiscal 1996, first-phase construction was carried out (the third waterway watch station and the system operation room on the third floor of port authority building were constructed) based on the panoramic images obtained by monitoring cameras. In this study, information on port administration in and out of Japan and the future of systems for controlling the entry to and departure from the port were presented. Basic system design was developed with the construction of a new watch station for the first waterway in the second phase.

## Studies for assessing return on investment in ports

Study	Fiscal year when study was conducted	Study outline
Quantitative analysis of benefits of large-scale earthquake-resistant facilities (Ministry of Transport)	1997 } 1998	Quantitative analysis was made of the benefits of earthquake-resistant facilities including seismic quays. In the studies of fiscal 1997, the framework for analysis was established and cost benefit analysis was made of Kobe Port as a case study
Basic study for estimating the return on investment in port facilities (Kawasaki City Port and Harbor Bureau)	1997	In order to estimate more accurately the return on investment in the port facilities improvement projects in Kawasaki City, an input-output table was prepared mainly for the port section of Kawasaki City based on the 1990 national input-output table, the latest table available, with data supplemented by collecting questionnaire responses

## Ports, Harbors and Marine Environment Research Institute

### Studies on environment creation technology

Study	Fiscal year when study was conducted	Study outline
<p>Study for improving the environment around the breakwater in Naha Port (Naha Ports and Airport Construction Office, Okinawa General Bureau)</p>	<p>1996 } 1997</p>	<p>Field studies had been conducted for eight years on corals growing on breakwaters in Naha Port. It had been revealed that the initial growth of coral larvae was affected by surface roughness of the structure and that light conditions, waves and turbidity would contribute to their subsequent growth. Based on the findings and existing knowledge, methods were developed for protecting, creating and using coral reefs in ports, and draft manuals were prepared for review. Case studies were also made in Naha Port.</p>
<p>Study on the methods for designing environmentally friendly breakwaters (Part II) (Kobe Studies and Design Office, Third District Port Construction Bureau, Ministry of Transport)</p>	<p>1996 } 1997</p>	<p>In addition to original functions of port facilities, demands have recently been growing for environmentally conscious functions such as environmental protection, creation of comfortable waterfront space and coordination with fisheries. At present, few manuals are available on the idea and method for designing environmentally friendly port structures. In this study, knowledge and technical know-how about currently available environmentally friendly functions, their effectiveness and economic viability were evaluated and methods were developed for designing environmentally friendly breakwaters</p>

<p>Water quality study in Nagoya Port (Nagoya Ports and Airport Construction Office, Fifth District Port Construction Bureau, Ministry of Transport)</p>	<p>1996 } 1997</p>	<p>In this study, data were collected on the present environmental conditions in Nagoya Port to identify environmental characteristics. Based on the results, water quality improvement methods were examined that would involve the installation of concrete blocks on the seabed to provide roughness to the bed to control tidal residual flow patterns and promote tidal exchange. As a result of analysis, it was found that using tidal residual flow by installing blocks on the seabed was likely to efficiently control the flow in Nagoya Port</p>
<p>Basic study for developing environmentally friendly structures (Fifth District Port Construction Bureau, Ministry of Transport)</p>	<p>1997</p>	<p>Port structures have recently been required to create comfortable waterfront space and provide for coexistence with species in addition to conventional functions such as protection of ports from waves and facilitation of loading. Studies have also been made to reduce costs. In this study, existing examples were organized and environmental measures were evaluated in Omaezaki, Yokkaichi and Nagoya Ports as case studies</p>

## Studies for using waste and recycled materials

Study	Fiscal year when study was conducted	Study outline
<p>Study for promoting construction waste recycling (Ministry of Transport)</p>	<p>1997</p>	<p>The ministries of International Trade and Industry; Health and Welfare; Agriculture, Forestry and Fisheries; Construction and Transport discussed the joint establishment of systems for promoting the use of construction waste produced during the implementation of public works projects under the control of the ministries of Agriculture, Forestry and Fisheries; Construction and Transport, and for making active use of recycled materials in social infrastructure development. The ministries of Agriculture, Forestry and Fisheries; Construction and Transport confirmed that developing information exchange and transport systems and establishing legal systems would be effective for promoting the use of materials recycled from concrete and asphalt concrete masses and construction waste materials. The Ministry of Health and Welfare organized case studies of recycling of sludge produced at construction sites and waste composed of various materials and proposed methods for widely using recycled materials. The Ministry of International Trade and Industry investigated the use and production of materials recycled from goods of which the other ministries made no studies, and examined methods for their recycling.</p>

<p>Study for controlling environmental pollution in waters along the coast of the Sea of Japan (First District Port Construction Bureau, Ministry of Transport)</p>	<p>1997</p>	<p>A follow-up survey was conducted mainly in the ports and coasts affected by heavy oil spill from the Russian tanker Nahodka to grasp the actual conditions of local natural environment. Studies were made of facilities, equipment, wide-area liaison systems and cooperation with local community that would be required along the coast of the Sea of Japan for protection from expected marine pollution.</p>
<p>Study for assessing the economic viability of marine transport in wide-area waste disposal plans (Coastal Environment Development Resources Utilization Center (CENTRUC))</p>	<p>1997</p>	<p>An economic feasibility study was made of a wide-area waste disposal plan for recycling waste by combining resource recovery plants located in waterfront areas with nationwide marine transport channels, and feasibility was verified.</p>

## Studies for port environment planning

Study	Fiscal year when study was conducted	Study outline
Study for assessing environmental development plans in Hidaka Port (Wakayama prefectural government)	1997	In order to help Hidaka Port create an environmentally friendly port, environmental characteristics of coasts and waters in the port and surrounding areas were identified. The effects of projects on the environment and the environment to be created were evaluated with the mitigation method using typical parameters. Then, environmental improvement plans were reviewed and developed for implementation in the area.
Study for Tokyo Bay environmental control planning (Port and Harbor Research Institute, Ministry of Transport)	1996 } 1997	In this study, examinations were made of the problems requiring solution for creating a desired water environment in Tokyo Bay, parameters for controlling the problems and the direction of measures to create a desired environment, based on the changes in water environment in Tokyo Bay and examples of environmental control plans in and out of Japan. Basic data were collected on the water environment described in the Tokyo Bay environmental control planning.

## Studies for developing *Ecoport* model project plans

Study	Fiscal year when study was conducted	Study outline
<p>Study on <i>Ecoport</i> model projects in Nagoya Port (Fourth District Port Construction Bureau, Ministry of Transport and Nagoya Port Authority)</p>	<p>1997</p>	<p>In order to create an excellent environment in Nagoya Port using port space, the natural environment, related plans and social demand in the port were identified, and consequently basic policy for defining <i>Ecoport</i> model projects was reviewed. The second area and Shin-maiko area were designated as model areas where environmental creation could be possible. Project plans were reviewed. In the second area, a green promenade will be constructed to offer accessibility to water. In the Shin-maiko area, the plan will center around a man-made beach serving as a habitat.</p>
<p>Study for developing Shimonoseki offshore man-made island <i>Ecoport</i> model project planning (Fourth District Port Construction Bureau, Ministry of Transport and Shimonoseki municipal government)</p>	<p>1997</p>	<p>The Shimonoseki offshore man-made island was specified in the port planning to promote transport, fisheries, and technological and cultural exchanges for building a "stage for comprehensive communication in east Asia". A transport and physical distribution base is now being constructed in the first phase. Considerations are given to the flow of seawater, and protection of natural coast lines and seaweed beds around the man-made island. New space will be created and tranquil sea will be formed behind the island. An <i>Ecoport</i> model project plan was therefore developed mainly for creating seaweed beds in surrounding revetments and forming waterfront green space.</p>

## Studies for promoting *Ecocoast* projects

Study	Fiscal year when study was conducted	Study outline
<p>Study for developing Sendai Port (Senrigahama) <i>Ecocoast</i> project plan (Fourth District Port Construction Bureau, Ministry of Transport; Nagasaki prefectural government and Hirado municipal government)</p>	1997	<p>An <i>Ecocoast</i> project plan has been prepared using wide and tranquil sea surface and long beaches in the Sendai Port Senrigahama area in Hirado City, Nagasaki Prefecture that has been serving as a place for marine recreation including bathing. The seabed in front of the planned project site accommodates eelgrass beds forming a habitat for marine species. Positions of groins and submerged dikes were located so as not to destroy the existing eelgrass beds. Adoption of natural stones was also suggested as bases for new seaweed beds.</p>
<p>Study for Takahama Port <i>Ecocoast</i> planning (Kumamoto prefectural government)</p>	1997	<p>A review was made of measures to control beach erosion and sedimentation and resultant wave overtopping and submersion of navigation channels on the beaches of Takahama Port in Amakusa, Kumamoto Prefecture. Considerations were given to the spawning of turtles. The beach has been designated as an <i>Ecocoast</i> for fiscal 1997.</p>

### Study for developing port landscape and green space plans

Study	Fiscal year when study was conducted	Study outline
<p>Study for Hitachinaka Port landscape development model project planning (Kashima Port and Airport Construction Office, Second District Port Construction Bureau, Ministry of Transport; and Hitachinaka Port Authority, Ibaraki Prefecture)</p>	<p>1997</p>	<p>A port landscape development model project plan was prepared based on the concept of <i>Technoscape</i> in Hitachinaka Port, a physical distribution hub in the Hitachinaka area, where an international port city is being constructed that accommodates parks.</p>