

Management of Earthquake Wastes

John H. Skinner, Ph.D., President ISWA

The International Symposium on the Management of Earthquake Wastes sponsored by JWMCA, ISWA and UNEP-IETC, held in Osaka in June 1995, reviewed the important experiences from the management of wastes generated by the Great Hanshin-Awaji Earthquake and other earthquakes and disasters elsewhere in the world. Over the next few years, the industry and government officials in Japan will continue to deal with the large quantity of wastes generated by the Hanshin-Awaji earthquake.

Before drawing general conclusions, it is important to point out that the team of international experts spent only one day on-site in the Kobe area reviewing the concrete waste processing facilities, the wood processing facilities and incinerators, and the residue disposal site at the Phoenix Project. This effort was not intended to be a detailed technical evaluation or audit. Instead, the goal was to identify successful activities as well as areas for improvement, and to use the situation in Kobe to illustrate some lessons learned and frame some broader issues that may provide guidance for future actions.

In developing this article, I have made extensive use of the materials provided by the international experts including paraphrasing sections of their reports. I refer the reader to the full reports from Mr. John Gullege, Mr. Dick W. Eerland and Mr. Erik K. Lauritzen for a more thorough presentation of these ideas.

WASTE MANAGEMENT IN THE PERSPECTIVE OF EMERGENCY RESPONSE

The initial response to an earthquake or other disaster must place its emphasis on saving human life. This includes emergency rescue activities as well as emergency demolition work to secure unstable buildings and structures to prevent additional loss of life. At the same time, critical infrastructure, including water, sewage and waste collection, health care, communication and transportation, must also be re-established to provide life and health sustaining services to people living in the area.

After the initial response with respect to emergency actions, the management strategies for dealing with the earthquake debris must be implemented. An important step is preparing a realistic assessment of the quantities and types of wastes generated. This is necessary for the development of collection and disposal systems and evaluation of potential markets for wastes that may be recycled. Prior identification of markets and

requirements for recycling and reuse will assist in the development of waste management strategies to utilize wastes in a manner that may benefit the local community.

RECYCLING AND REUSE AS A STRATEGY MANAGING EARTHQUAKE WASTES

In the Kobe and Osaka area the Phoenix Project had been established to dispose of normally occurring domestic and industrial wastes and surplus soil and sand through the reclamation of land from the sea. This option, at least on an initial basis, was available for disposing of the significant volumes of concrete and other noncombustible wastes generated in the aftermath of the earthquake. Since the waste generation and disposal effort is expected to last a period of years, it is now possible to evaluate other disposal options as well as potential markets for recovered materials.

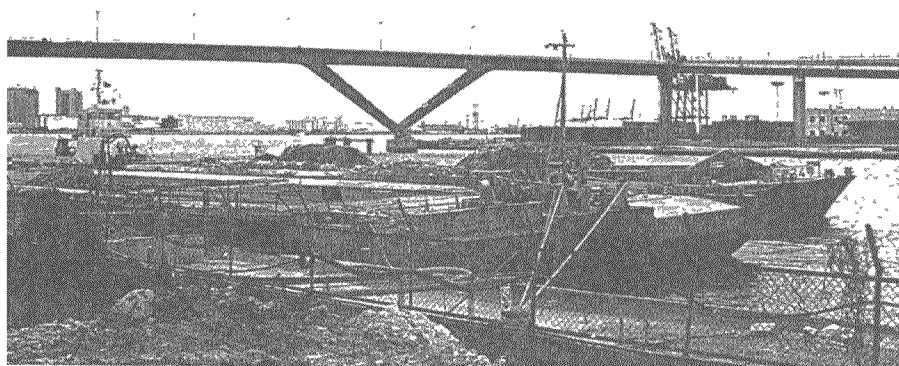
During the initial stages of response to the earthquake there was open burning of wood waste which has subsequently been curtailed. The remaining wood and other combustible wastes are to be burned in several existing and planned incinerators but without the recovery of energy from the combustion process. Energy recovery offers another possibility of reclaiming value from these wastes and the energy savings could

partially offset processing costs.

ACTIVITIES DURING THE DEMOLITION STAGE

The progress of the demolition in Kobe clearly demonstrated the high quality efforts with respect to the speed of the demolition and clearance of damaged buildings and structures. The demolition work is carried out with considerable regard for environmental protection and health and safety. The current methods of shielding the demolition sites is very impressive with respect to reduction of noise, dust and negative aesthetic impacts. The system includes professional and well managed transportation, handling and transfer of waste materials over the roads from the demolition sites to transfer sites, and then by barge to the land reclamation areas in Osaka Bay.

Because of the high quality of this work it was observed that the costs of demolition and transportation of materials were relatively high as compared with costs in Europe and the US. Because this work will continue into the future, the options for the development of capacity for recycling of materials and recovery of energy could be considered. This could produce revenues to offset some of the demolition and transport costs.



Transfer station for demolition waste in Kobe port where clean blocks are transported by barge to artificial islands in the port area. The bridge in the background has been rebuilt