DESIGN OF SOLID WASTE MANAGEMENT FACILITIES OF EKS PELABUHAN BULELENG BEACH RESORT, BULELENG REGENCY

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ABSTRACT

The average number of tourists in Eks Pelabuhan Buleleng beach resort from January to March 2014 was 288, 15% of those were foreigners. A number of supporting facilities, such as canteens, floating restaurants, a tourist hall and a playing ground have been built. These facilities generate solid waste (SW), which have not been managed properly. In addition, this recreation facility receives SW from the Buleleng River and the sea. The objectives of this study are to measure the SW generation and composition, to design SW management system, and to determine the capital, operation and maintenance costs of SW management activities in the study area.

Measurements of SW generation and composition were done according to the national standards SNI 19-3964-1994. The SW samples from the beach and the river were collected using transect method. Design of solid waste management system, which included SW container provision, collection, transfer and treatment, was made according to the National Standards SNI 19-2454-2002, Municipal Solid Waste Management Guideline Book 1 of 2013 of the Directorate General of Cipta Karya. Artistic touch was considered in the design for supporting the tourism activities.

Results of the research showed that the SW generation rate in the study area was 170.8 kg/day, or 1.033 m³/day. Contribution of each SW source was as the following: commercial 32.3%, garden 27.3%, office 0.88%, sea 27.13%.
and Buleleng River 8.45%. The SW composition was food waste 14.4%, garden waste 19.7%, plastics 29.8%, paper 8.04%, wood 4.61%, textile 2.21%, metals 0.36%, leather 19.21%.

The study area was designed to provide separated SW containers. The floating restaurant was facilitated with 4 containers of 70 L capacity for biodegradable SW, and 4 containers of 15 L capacity for recyclable SW. Each canteen was provided with 2x2 trash bags of 20 L capacity, each of which was for biodegradable and recyclable SW. Containers for office and public facilities were of 4 x 2 units of 30 L capacity for biodegradable and recyclable SW. The park area was facilitated 7 x 2 containers of 60 L capacity. SW from the sea would be contained in 5 x 2 containers of 250 L capacity, whereas 2 x 2 containers of 250 L capacity would be provided for placing the river SW. A handcart of 1120 capacity was designed for separated SW collection. One transfer station was planned with the provision of 3 containers with capacity 660 L for residual waste and 1 container with capacity 900L for recyclable waste, 2 units of 2.7 m³ composting facilities, and 1 unit of shredding machine. A screen would be installed for collecting the SW from the Buleleng river. Estimated costs for the provision of SW management facilities in the study area were as the following: investment Rp 42,590,280,-, operation Rp 10,872,000,-/month, and maintenance Rp 4,150,000,-/year.

**Keywords**: beach resort, design, solid waste management