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Floating Promenade and Pavilions for Tourism Revitalization

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Fixed vs Floating

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Introduction

- First floating promenade and pavilions was built on water in Korea, the place is historical region of Buyeo-gun, west and middle part of Korean peninsula, in order to promote the health of residents and to activate the tourism & economy in the region.
- Purpose of the presentation is to analyze the site, review the master plan, and consider the design and construction process and to find some lessons and tasks for the references in the future projects.

Location of Korea

Location of Buyeo-Gun

Goal and Site Analysis

Goal of the Project

- The site, Buyeo-gun was the capital of Baekje(18 BCE to 660 CE) and has abundant historical and cultural tourism resources, and is a core area of the Baekje cultural zone, but due to the lack of tourism infrastructure, it is hard to actively welcome visitors.
- The goal is to transform Buyeo-gun area into a residential tourism destination by developing the area around Bansan Reservoir which has an excellent natural environment, into a new water-based tourist destination.

Analysis of the Site

Location

- Buyeo-gun is located 180km from Seoul and it takes about 1 to 2 hours to travel from the metropolitan area to the site. The site can be accessed by using the Expressways and National Road. Therefore, transportation to the site is relatively convenient.

Map of Bansan Reservoir

Natural Environment

- To the north of the site, mountains are formed around Baekhwasan Mountain, and to the south, low-mountainous hills are formed. The northern region is the place where Buyeo-gun's core forest resources are distributed.
- There are around 90 reservoirs including Bansan Reservoir, Oksan Reservoir, Bokgeum Reservoir, and Gahwa Reservoir around Buyeo-gun, and the Geumgang River runs through Buyeo-gun. So, water can be a good factor to the local development.

Human Environment

- The use districts within the target area are mainly program management areas and agricultural & forestry areas.
- There were already plans of local attraction facilities, developed according to the 'Basic Plan for the Comprehensive Development Project of the Rural Village in the Buyeo Bansan area (2004)'.

Related Laws

- Since the site is an agricultural & forestry area in terms of use district, change procedures of use district need to be followed for the development.
- And as the site was designated as an agricultural protection area under the Agricultural Land Act, it was also necessary to release the agricultural promotion area and to implement approval for new use other than the purpose of agricultural infrastructure.

Master Plan of the Site

Development Direction

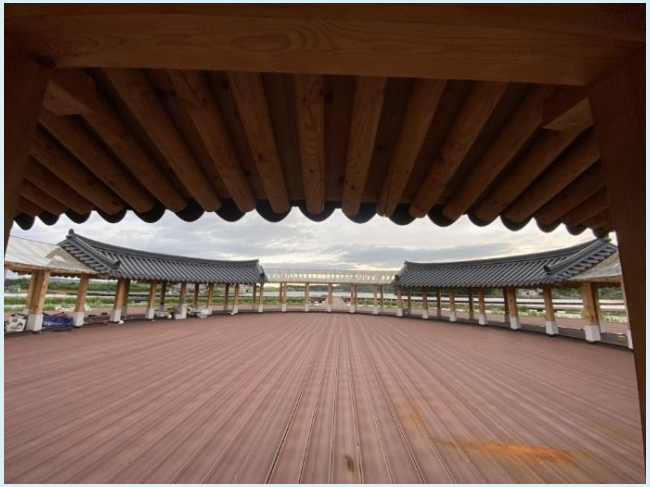
- The concept of the master plan was creating a unique water-friendly space by enjoying various water leisure activities using the local waterside resources and using it as a complex natural healing and education facility.
- The idea was actively utilizing the waterside space in Buyeo-gun to plan a dynamic experiential tourism activity center instead of the existing static historical and cultural tourism resources, creating a space that can be visited by various classes and age groups, such as a nature learning facility for student groups, a resting space and canoeing facility for local residents and visitors from outside.

Space Planning

- The space planning of Bansan Reservoir Waterside Park was established with a focus on areas with good accessibility to existing facilities such as Buyeo-gun sports complex, “Insect World”, and surrounding settlement areas. A “Canoe Experience Center” around the training ground of Buyeo-gun canoe team would be established, and a “Water Sports Center” and an “Aquatic Life Observation Center” would be created. A “Waterside Trail” and an “Observatory” that the waterside area can be viewed and explored at once would be built.
- This research related project is going to discuss the waterside trail only.

Master Plan(Original)

Design and Construction of the Floating Project

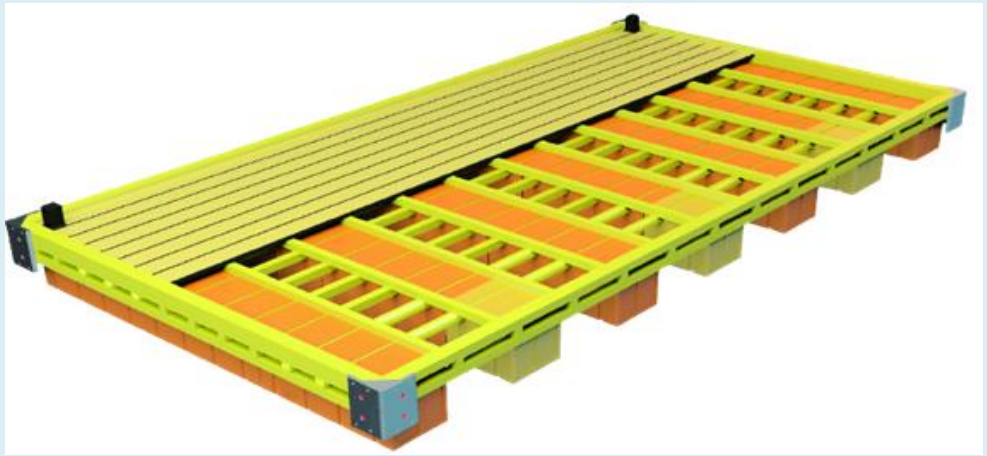


Design of the Facility

- Project team proposed a floating promenade with some pavilions instead of originally planned perimeter trail. Actually, there were some difficulties of private land purchase, and also the floating solution with the advantages of close contact with water and flexible adaptation to water level change was strongly recommended and accepted.
- Design of the promenade with some pavilions was developed to symbolize the traditional pond (historical property) which has a walkway and rest area in the center. The design focused on building a floating promenade and some pavilions of traditional house (Hanok) & passage for a rest space and performance area on water. And some floating plant gardens were introduced to improve the visual and water environment.
- In order to symbolize the historical building property of the area, the pavilion was built as a signature architecture. The traditional style house and passage with a diameter of 38m floor was reinterpreted in a Hanok style, which was designed and constructed directly by a specialized company called Hanok Seum.
- Legal issues were anticipated to get the permission of the facility, but it was somewhat difficult to obtain the occupancy permit of public water from regulatory agency. Finally, occupancy permit of public water and permission of the facility were issued after the purpose of the project with architectural legal evidences, sample projects abroad, and structural calculation documents for safety were submitted and reviewed.

Construction of the Facility

- Overview of Floating Structure
- Name of Construction Method: Floating Structure on Water
- Registration Number: Patent No. 10-2196017(2020.12.22.)
- Patentee: Global Ocean Tech (Korea)
- Description of Floating Structure: A method of manufacturing a floating structure by inserting one or more PE-coated angle pipes into a rectangular floating unit that provides buoyancy to the facility, and forming the entire structure by fusion-bonding the pipes by crossing them on the upper part of box-type pontoons, and fusion-bonding a foothold with an anti-slip function on the upper part of the pipes.



Basic Floating Structure Module

Features of Floating Structure

- Major features of floating structure are as follows;
- Structural safety: The structure cross-links PE-coated steel and PE-coated angle pipe reinforcement on top for rigidity.
- Economic efficiency: The simple manufacturing process provides for economic efficiency due to shortened construction period. Various colors for the installation site are available. Reduction of the construction period and the cost can be attained by proper mooring system.
- Manufacturing and construction: Excellent constructability comes from various shape and size (modular type) and simplicity of construction method by the on-site joints with the PE fusion-bonding method is applicable.
- Quality control: Good quality control comes from factory production and the advantages could be the constructability and shortening construction period.
- Maintenance: No rust prevention work is required due to PE material coating, and repair works can be easily done at the construction site with replacing parts.

Description of Mooring System

- Floating structure system is consisted of PE-coated rectangular angle pipes with pontoon for buoyancy and the mooring system.
- The mooring system with catenary method is applied to maintain a mooring capacity of about twice load of the local current and wind speed through structural calculations. Elastic rubber rope and concrete anchor blocks are used to the mooring system.

Lessons and Tasks from the Project

- High-gravity multi-use floating structure has been increasingly interested in Korea after this project. Floating buildings are already institutionally possible due to the Building Act. However, awareness of floating structures in Korea is still low because of not many cases and safety concerns.

- Great contribution of the floating project to the physical and emotional health promotion of residents is anticipated. Additionally, easy accessibility and some design of traditional atmosphere will help to attract tourist and activate local economy.

- Modularization of an appropriate size with more flexible connection method needs to be developed and will be preferable for easy construction and minimum maintenance for the floating project.

- Efforts are needed to enhance the social acceptability for the floating projects through the technical standard establishment for structural safety, enacting a related ordinance, and institutional guideline establishment of operation and maintenance. In particular, social acceptability by public institutions in charge of floating facility management is more important for the initial introduction of floating projects.

- It is expected that our floating projects will be widely known, expand the facility types & region, get some fame in the floating solution industry, play a role in improving the social acceptability over time.

Further Floating Projects

Canoe Mooring Facility

Floating Stage

Temporary Floating Bridge for Festival Period

Floating Promenade

References

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