

## A Study on Development Directions of Environment-Friendly Cheonghak Waterfront Park through Surveys

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**Abstract :** *The road construction near the existing lighter's wharf has completed but the lighter's wharf has been still unavailable and neglected. Therefore, the site needs the urgent measures to clean up and properly take advantage of the lighter's wharf. This study sought to improve the regional amenities and revitalize the coastal environment by creating an environment-friendly waterfront park utilizing features of the existing lighter's wharf as part of improvement measures. In addition, surveys were conducted to develop an waterfront park capable of effectively using the land and improving the cleanliness and safety of the coastal scenic beauty, leading to various meaningful opinions on the residents' awareness of the potential park site, the facilities necessary for the park, the development directions of the park and the timing of park development. If an waterfront park is created through the residents' participation, It can share a sustainable utility value of the coastal area. Therefore, this will result in boosting the connection with redevelopment plan for the North Port, along with improving the quality of the residents' life, strengthening Busan's status as a maritime tourism city.*

**Key words :** *Survey, Environment-friendly, Waterfront park, Regional characteristics, Amenity*

### 1. Introduction

Yeongdo island surrounded by sea is one of the local autonomous entities in Busan. The island has Hanjin Shipbuilding Co. and other companies with many employees. In addition, on the island, there are various natural resources that we always enjoy with sea, including scenic spots like Taejongdae and Yeongdo island lighthouse. Recently, there are a lot of Busan city's policies promoting "Ocean Capital" including the governmental OK21 Project. In particular, related with the existing redevelopment project of the North Port, the project districts include Yeongdo's coast as well as the North Port, itself. As a result, Yeongdo is expected to face mounting pressure for development, and needs proper measures to improve the coastal areas and vitalize a maritime tourism. It is well known that Yeongdo has Taejongdae Park, Gamji Beach & Coastal Walk, and Jeoryeong Coastal Walk. In the future, once connected by the North Port Bridge and the South Port Bridge, Yeongdo is expected to see a super hike in traffic and consequently a surge in floating population.

Meantime, the potential park site located in Cheonghak-dong near a place connected with the North Port Bridge continued to decline due to its poor environment, and has been left unused because of the residents' indifference and its poor accessibility. Now, the urgent improvement of the environment is needed to overcome this situation.

### 2. Purpose and Effect

#### 2.1 Purpose

Adjacent to the site, a four-lane road construction has been completed between SK Oil Reservoir and Hankook Tire. Now, the site near the new road lost a function as the existing lighter's wharf and its environment is worsening and rapidly declining. Therefore, the site needs the urgent measures to clean up and properly utilize the lighter's wharf.

This study aimed to improve the regional amenities and link them with other tourism resources in Yeongdo by developing an environment-friendly waterfront park utilizing geological advantages of the existing lighter's wharf and creating leisure area for the residents and visitors.

#### 2.2 Effect

By cleaning up the existing lighter's wharf under poor conditions, the environment can be improved, and the environment-friendly waterfront park with cleanliness and safety will be created. This will also help facilitate the maritime tourism resources through linking the potential park with other resources.

In addition, to develop an waterfront park can result in improving the coastal environment, effectively using the land and enhancing the cleanliness and safety of and accessibility to the coastal scenic beauty.

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If an waterfront park is created through the residents' participation, they can share a sustainable utility value of the coastal area. Therefore, this will result in boosting the connection with redevelopment plan for the North Port, along with improving the quality of the residents' life, strengthening Busan's status as a maritime tourism city.

### 3. Features and Current State of the Potential Park Site

The site for the waterfront park is located at 330-63, Cheonghak-dong, Yeongdo-gu, Busan (see Fig. 1) and the current state of the land is shown in Fig. 2.

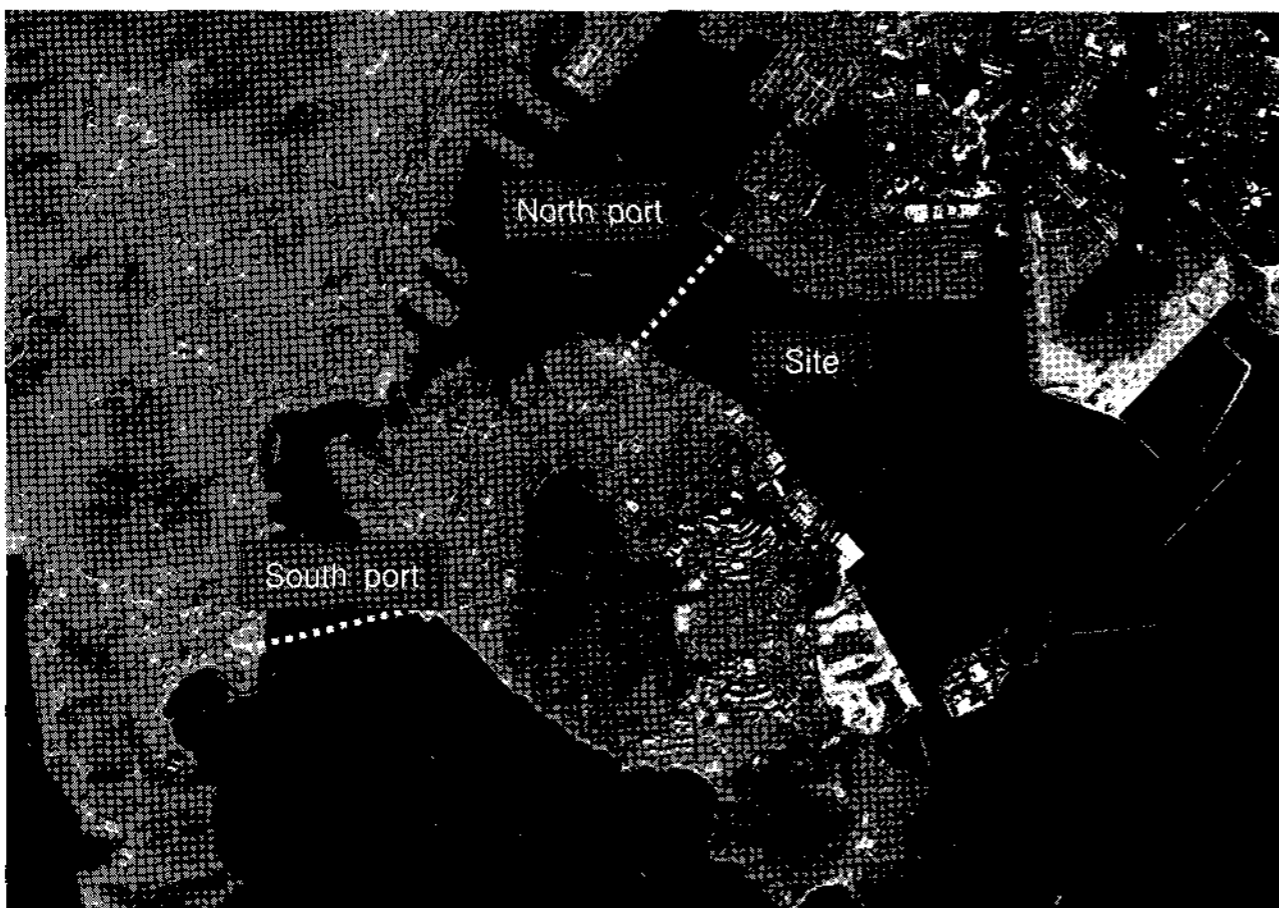


Fig. 1 Location of the potential park site

The site is located in Cheonghak-dong, Yeongdo-gu, Busan. Once connected by the North Port Bridge and the South Port Bridge, Yeongdo is expected to see a rise in traffic and floating population. In particular, related with the coast waterfront development project represented by the redevelopment of the North Port, Yeongdo is expected to face mounting pressure for development.

Table 1 The current distribution of lot numbers by owners

Owner	Lot Number	Category of Land	Size(m <sup>2</sup> )	Included Area	Remarks
Total	7 parcels		17,585	13,300	
Ministry of Construction & Transportation	Cheonghak-dong 330-63	Road	2,555	1,050	Approved
	217-44	Ditch	169	169	
	217-33	Road	5,825	4,034	Approved
Ministry of Maritime Affairs & Fisheries	330-62	Miscellaneous Land	2,073	2,073	
	217-12		477	477	
Ministry of Finance & Economy	217-43		1,649	1,649	Approved
Sea	Natural Reclamation			3,848	

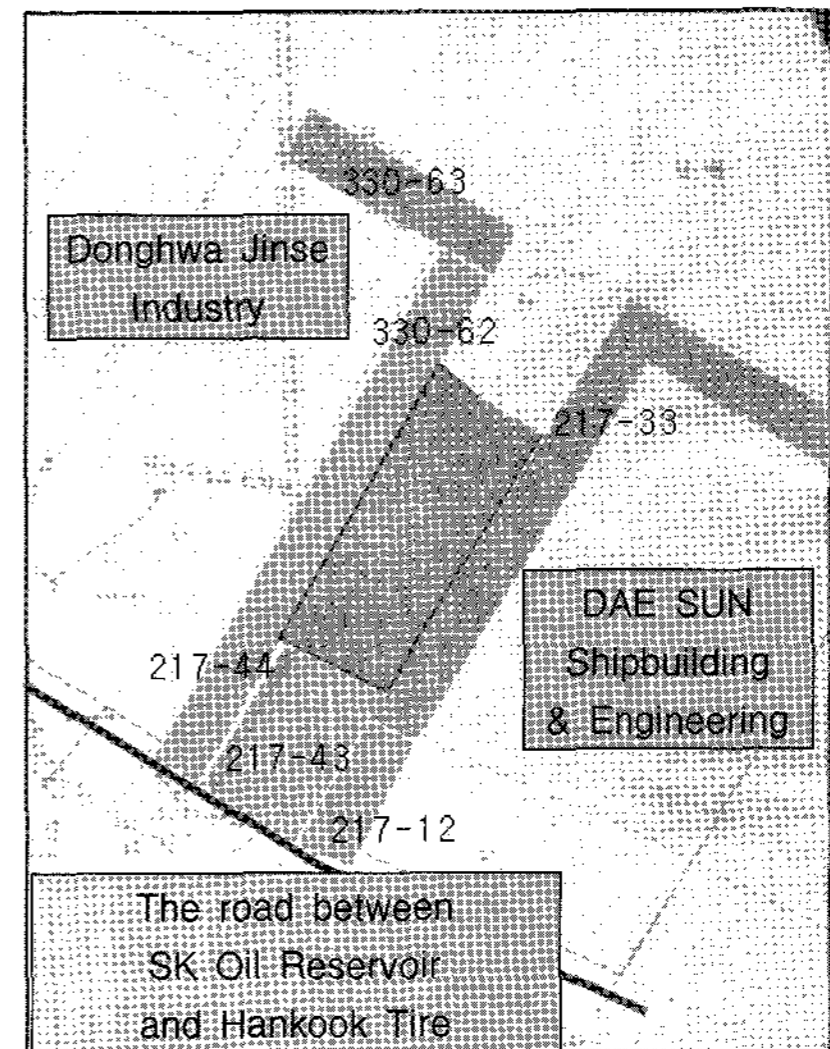


Fig. 2 The current layout of adjacent facilities

The potential park site totals a land of 13,300m<sup>2</sup>, comprising parcels owned by the Ministry of Land, Transport & Maritime Affairs (three parcels of 5,253m<sup>2</sup> consisting of roads and ditches owned by the former Ministry of Construction & Transportation and two parcels of 2,550m<sup>2</sup> consisting of the miscellaneous land owned by the former Ministry of Maritime Affairs & Fisheries); one parcel of 1,649m<sup>2</sup> consisting of the miscellaneous land owned by the former Ministry of Finance & Economy; and reclaimed sea area of 3,848m<sup>2</sup>.

The site (see Fig. 2, 3-1, 3-2 and 3-3) borders DAE SUN Shipbuilding & Engineering Co. on its right and Donghwa Jinse Industry's yard on its left. Adjacent to the site, a four-lane road has been constructed between SK Oil Reservoir and Hankook Tire.

The changes in the state of the potential park site are shown in figure 3-1 (2005), 3-2 (2007) and 3-3 (May 2008).

In addition, as the section of Yeongdo to be connected to the North Port Bridge is located within about 300 meters in a crow line, the lighter's wharfs vital for the fishermen's subsistence has been drastically debilitated and left derelict. This has led to a functional deterioration of the surrounding environment. As a result, there has been the growing necessity of developing the site into a waterfront park.

A voluntary residents' committee on developing the Cheonghak Waterfront Park was organized in September 2005 to push forward the development project. The basic and detail design for the waterfront was completed and its construction began on April 25, 2008 with US\$1.2 million (US\$0.9 million from the Regional Maritime Affairs & Fisheries Office and US\$0.3 million from Busan Port Authority).

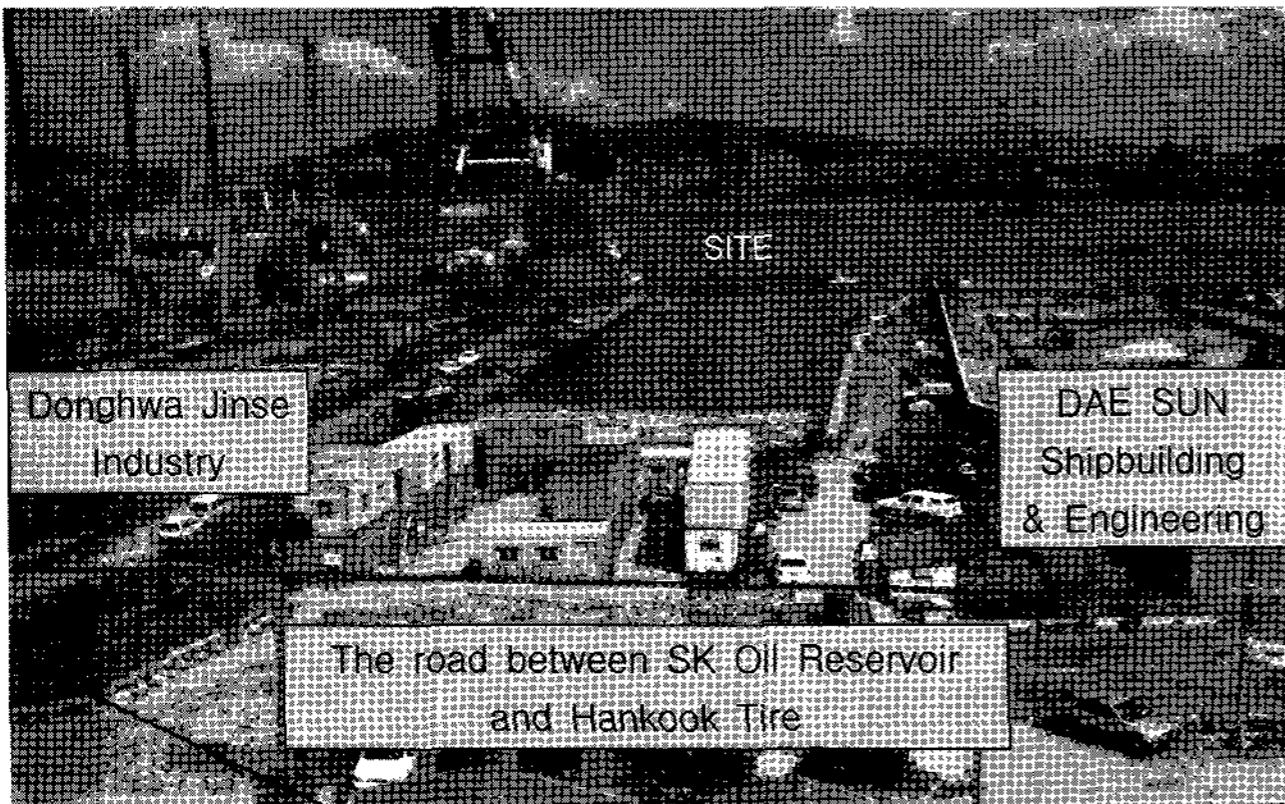


Fig. 3-1 Bird's eye view of the site (2005)



Fig. 3-2 Bird's eye view of the site after the road was built (2007)

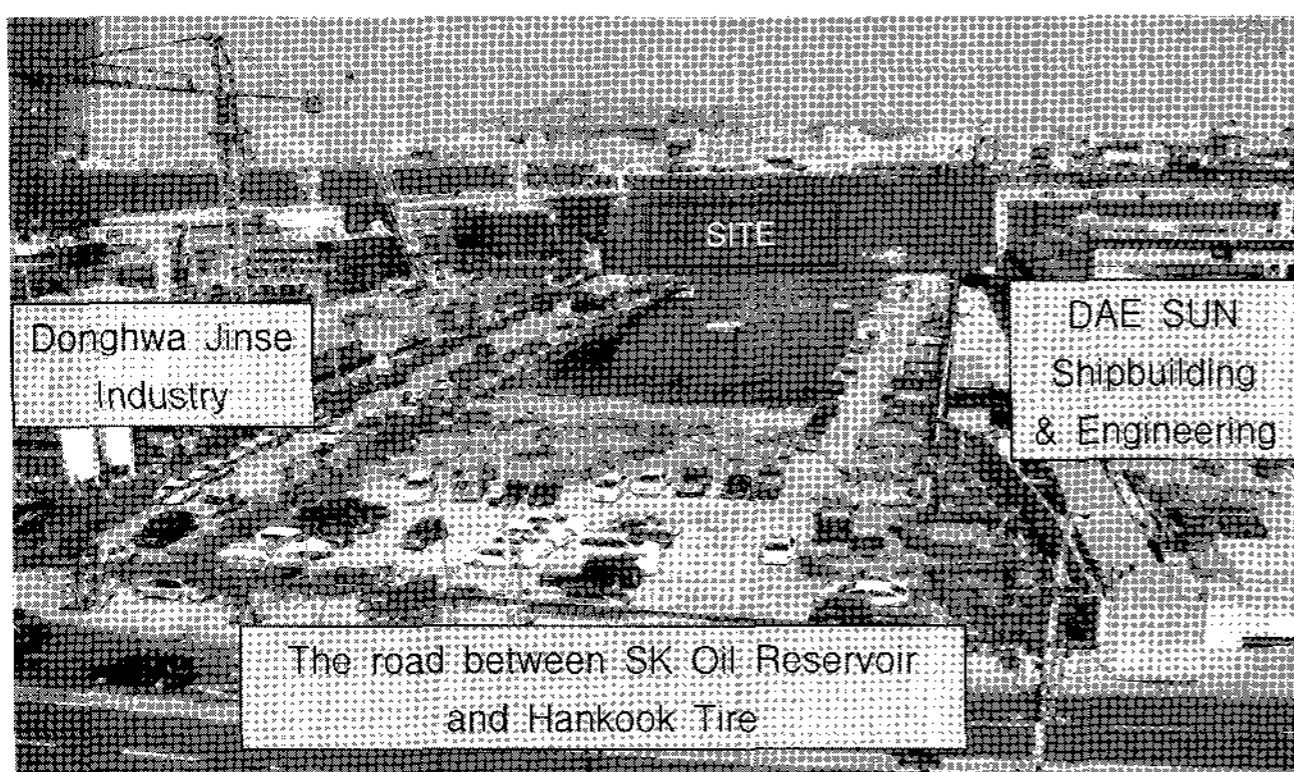


Fig. 3-3 Bird's eye view of the site after waterfront construction began (May 2008)

## 4. Surveys on demands and needs

### 4.1 Overview

Preliminary research was done through surveying on users' demands and needs to boost utilization of potential Cheonghak waterfront park.

The research was performed by means of the personal interview survey. In other words, questioners directly surveyed people on the site and the respondents filled out

the questionnaires. A total of 85 questionnaires were distributed and collected, 45 out of which had valid responses.

The surveys took place two times for a total of six days. The first survey took place for three days from April 6 (Tue.) to 8 (Fri.), 2005, and the second survey from May 9 (Mon.) to 11 (Wed.), 2005. They did not target a specific period or day, but were usually conducted during week days from 9:30 a.m. to 5:30 p.m.. In order to determine demands of a wide range of ages, the survey participants include those who the questioners met on the site as well as visitors to the site. The questionnaire has six items and its result showed a distribution of age. The items are the following:

- (1) Age
- (2) Gender
- (3) Awareness of potential park site
- (4) Facilities necessary for the park
- (5) Development directions of future park
- (6) The timing of park development

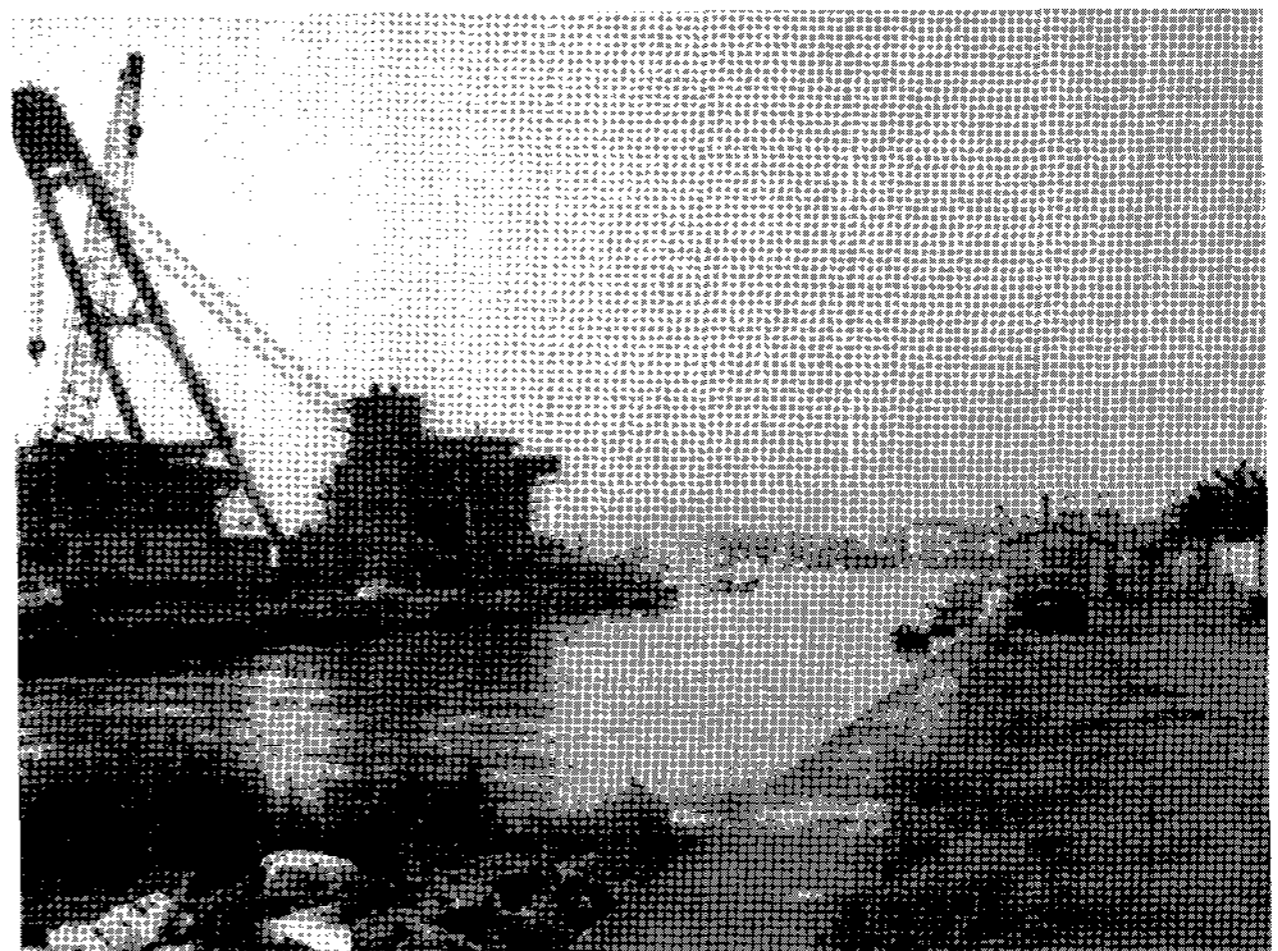


Fig. 4-1-1 left side view of the site (past)



Fig. 4-2-1 right side view of the site (past)



Fig. 4-3-1 side viewed from the sea (past)

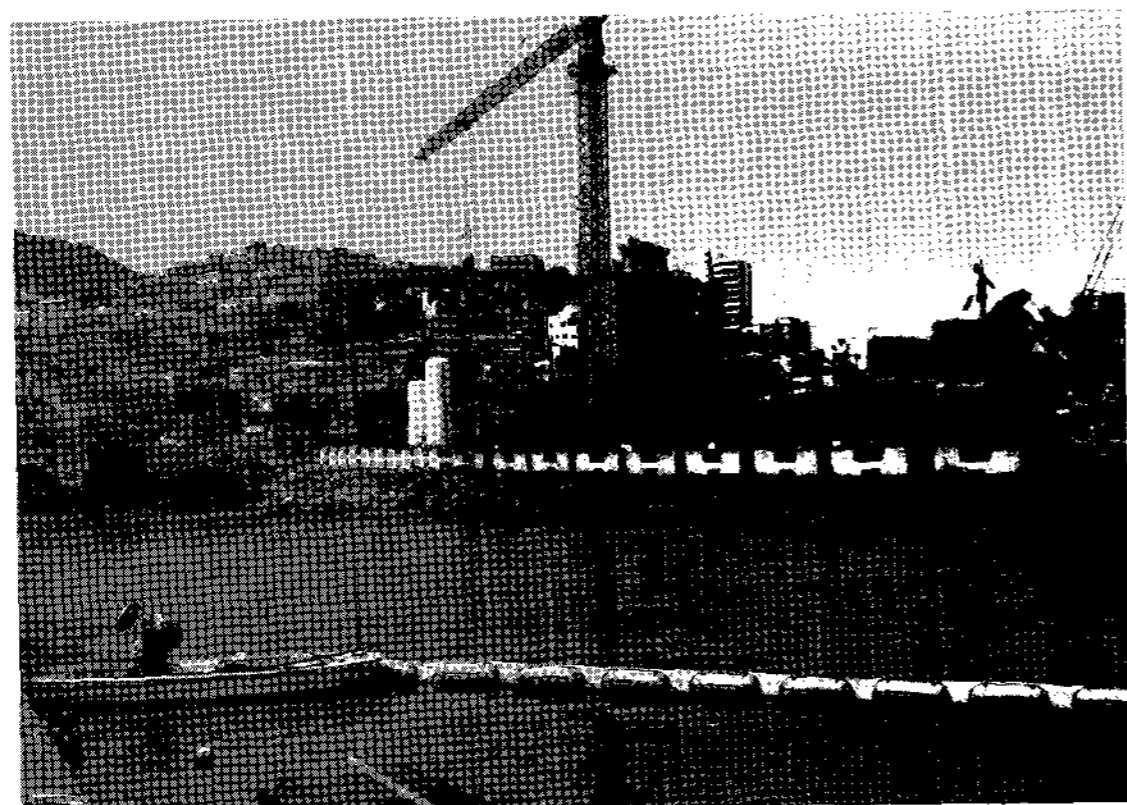


Fig. 4-1-2 left side view of the site (now)

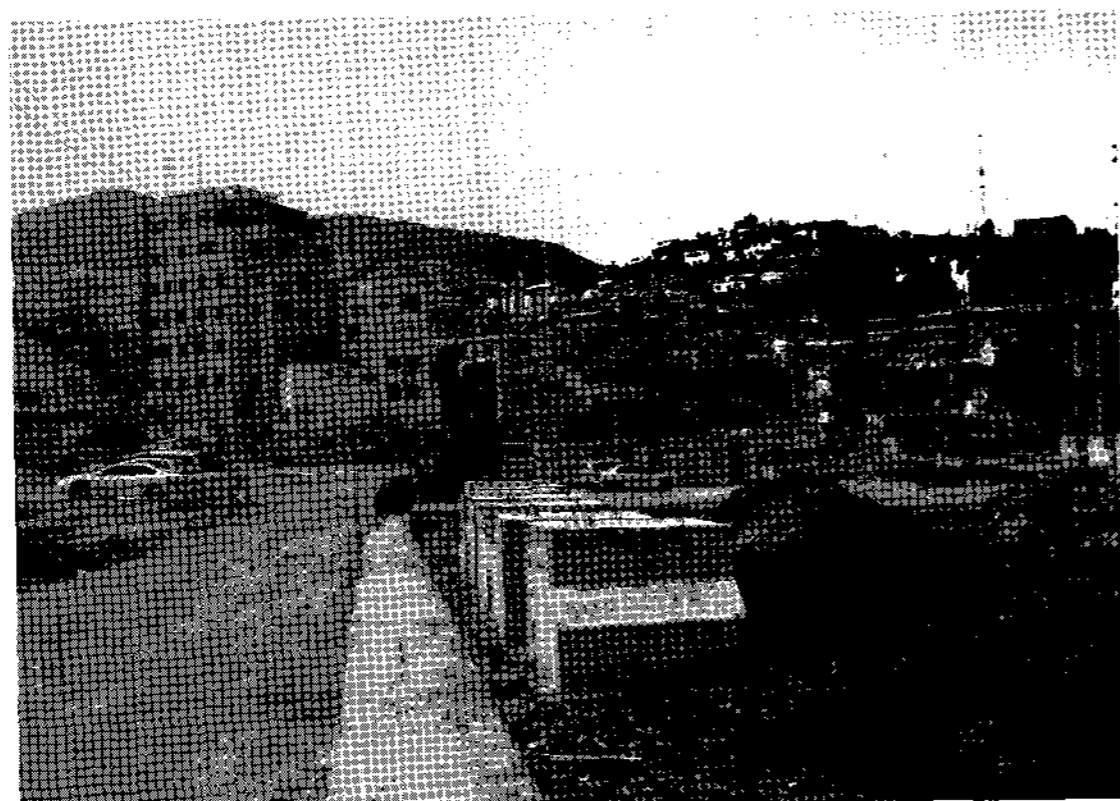


Fig. 4-2-2 right side view of the site (now)

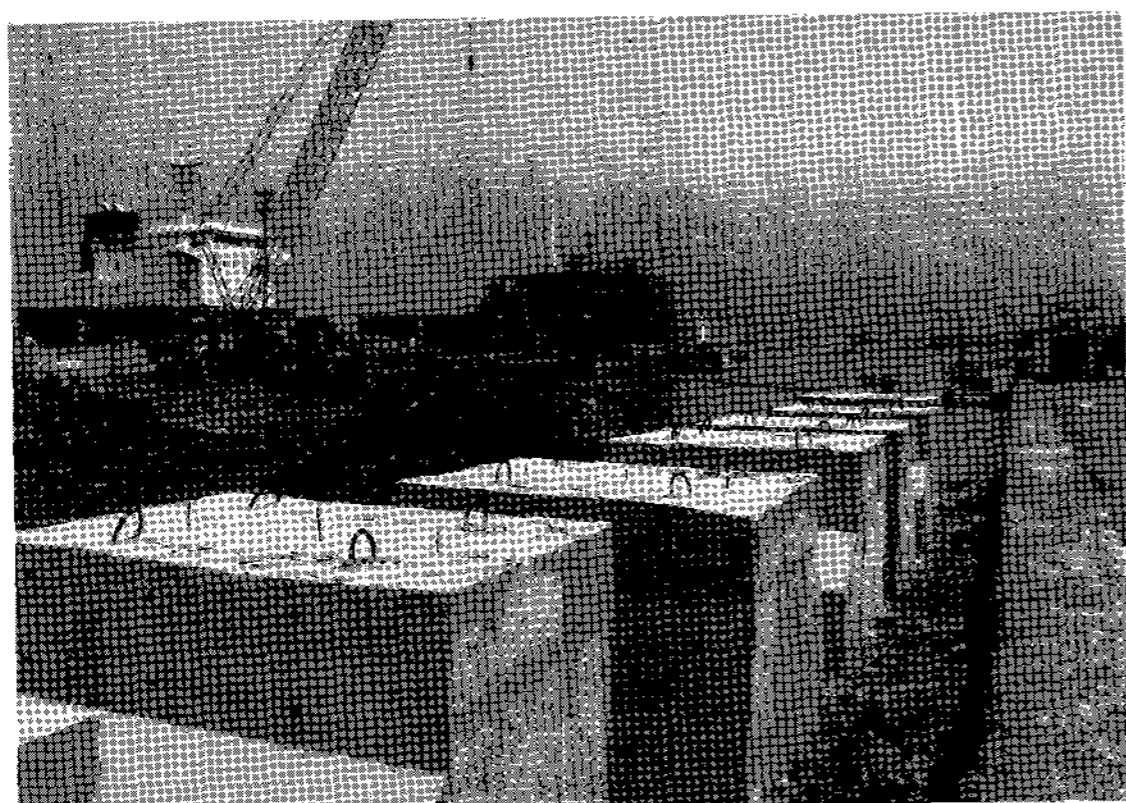


Fig. 4-3-2 side viewed from the sea (now)

## 4.2 Contents

### (1) Age

Of the respondents, the rate of people in their 30s(22.2%) and 50s (20%) are higher than the other age groups. The rate of teenager(13.3%) and people in their 60s(11.1%) are relatively low. However, ages showed the even distribution as a whole.

Table 2 The age distribution of respondents

Classification		Distribution (person, %)	
Age	Teenagers (13-19)	6	13.3
	Twenties (20-29)	7	15.6
	Thirties (30-39)	10	22.2
	Forties (40-49)	8	17.8
	Fifties (50-59)	9	20.0
	Sixties (60-69)	5	11.1
	Total	45	100

### (2) Gender

57.8% of the respondents are male while 42.2% are females. Those in the 30s and 50s accounted for the highest rate of the respondents while those in the 60s took up the lowest.

Table 3 shows the age distribution of respondents by gender.

The developments of the site's surroundings from 2005 to 2008 are shown in figure 4-1, 4-2, 4-3.

Table 3 Age distribution of respondents by gender

Classification		Age Distribution (Person, %)												Total	
		10s		20s		30s		40s		50s		60s			
Gender	Male	2	33	4	57	7	70	4	50	6	67	3	60	26	57.8
	Female	4	67	3	43	3	30	4	50	3	33	2	40	19	42.2
	Total	6	100	7	100	10	100	8	100	9	100	5	100	45	100

### (3) Awareness of potential park site

Of those in the survey on awareness of potential park site (possibility of a waterfront park), 73.4% replied that they don't know, while 26.6% said they know. The former is 2.8 times higher than the latter. The result shows that ordinary people are not aware of possibility of the site as a future park.

The rate of people in their 30s(21.2%), 40s(18.2%), and 50s(18.2%) accounts for 57.6%, showing that those people who are most socially involved are not aware of possibility of the site as a future park.

The following table 4 indicates awareness of potential park site and age distribution.

**Table 4** Awareness of potential park site and age distribution

Classification	Age distribution (Person, %)												Total	
	10s		20s		30s		40s		50s		60s			
Aware	1	17	2	29	3	30	2	25	3	33	1	20	12	26.6
Not aware	5	83	5	71	7	70	6	75	6	67	4	80	33	73.4
Total	6	100	7	100	10	100	8	100	9	100	5	100	45	100

(4) Facilities necessary for the park

Answers of the respondents indicates that relaxing facilities (28.9%) and an esplanade (24.4%) are most necessary for the park, followed by sports facilities (17.8%) and trees (13.3%). Table 5 shows facilities necessary for the park and age distribution.

**Table 5** Facilities necessary for the park and age distribution

Classification	Age distribution (Person, %)												Total	
	10s		20s		30s		40s		50s		60s			
Relaxing facilities	1	17	2	29	2	14	2	17	3	33	3	60	13	28.9
esplanade	0	0	1	14	3	29	3	33	3	33	1	20	11	24.4
convenience facilities	1	17	1	14	1	14	0	0	0	0	0	0	3	6.7
playground facilities	2	33	1	14	1	14	0	0	0	0	0	0	4	8.9
Sports facilities	2	33	2	29	2	14	1	17	1	12	0	0	8	17.8
Trees	0	0	0	0	1	14	2	33	2	22	1	20	6	13.3
Total	6	100	7	100	10	100	8	100	9	100	5	100	45	100

Teenagers wanted playground(33%) & sports facilities (33%) the most. Those in their 20s relaxing facilities(29%) & sports facilities(29%), whereas esplanade(29%) was preference by the age group 30s. Two strength preferences for the age groups 40s and 50s were esplanade(33%) & trees(33%) and relaxing facilities(33%) & trees(33%) respectively.

Finally, the age group 60s wanted relaxing facilities(60%). These figures show that preferences vary according to age groups.

(5) Future development directions of the park

Of participants in the survey on future development directions of the park, 46.7% liked park facilities and esplanades the most except sports facility by age 10s(50%), 26.7% preferred forest park, 22.2% wanted sport facilities, 2% wanted it to remain unchanged, and 2.2% wanted others(fishing).

Table 6 shows the future development directions of the

park and age distribution.

**Table 6** Future development directions of the park and age distribution

Classification	Age distribution (Person, %)												Total	
	10s		20s		30s		40s		50s		60s			
Park facilities and esplanade	2	33	4	57	5	50	3	37.5	4	45	3	60	21	46.7
Forest park	1	17	1	14	3	30	3	37.5	2	22	2	40	12	26.7
Sports park	3	50	2	29	1	10	2	25	2	22	0	0	10	22.2
remain unchanged	0	0	0	0	1	10	0	0	0	0	0	0	1	2.2
The others	0	0	0	0	0	0	0	0	1	11	0	0	1	2.2
Total	6	100	7	100	10	100	8	100	9	100	5	100	45	100

(6) The timing of park development

Of the respondents, 44.4% reported that the park development is a little urgent and 42.2% thought it is very urgent, which means that the total of 86.6% thought it is urgent. The figure of 86.6% is overwhelmingly six times higher than 13.4% which includes the rate of those who said it is not urgent(9.9%) and the rate of those who said it can wait(4.5%).

The figures indicate that the residents want urgent creation of the park which results in efficient utilization of land and more pleasant and safer coastal landscape, along with environmental improvement of the existing lighter's wharf.

The following table 7 provides the timing of park development and age distribution.

**Table 7** Timing of park development and age distribution

Classification	Distribution												Total	
	10s		20s		30s		40s		50s		60s			
Very urgent	2	33	2	29	4	40	3	37.5	5	56	3	60	19	42.2
A little urgent	3	50	3	43	5	50	4	50	3	33	2	40	20	44.4
Not urgent	1	17	1	14	1	10	1	12.5	0	0	0	0	4	8.9
Can wait	0	0	1	14	0	0	0	0	1	11	0	0	2	4.5
Total	6	100	7	100	10	100	8	100	9	100	5	100	45	100

5. Conclusion

This study aimed to facilitate the development of an environment-friendly waterfront park by taking advantage of the environmental features of the site as part of a measure to clean up and properly utilize the lighter's wharf which has been unused and neglected after the creation of a four-lane road improved access to the site.

In addition, a survey was conducted on the development

of a waterfront park to effectively use the land and improve the cleanliness and safety of the coastal area. The following are the results of the survey on residents' awareness of the potential park site, facilities necessary for the park, development directions of the park and the timing of park development.

(1) 73.4% of those surveyed said they didn't know that the site is the land for a waterfront park, 2.8 times higher than 26.6% those who said they were aware of it. This shows that residents don't recognize the possibility of developing the site into a park.

Among those who said they didn't know, the rate of age 30s(21.2%), 40s(18.2%), and 50s(18.2%) accounts for 57.6%, showing that those people who are most socially involved are not aware of possibility of the site as a future park. This finding suggests that promotions are much needed for residents about the possibility of developing the site into a waterfront park.

(2) Respondents selected relaxing facilities and esplanade as the most necessary facilities (accounting for 28.9% and 24.4% respectively), followed by sports facilities (17.8%) and trees (13.32%).

Teenagers wanted playground(33%) & sports facilities(33%) the most. Those in their 20s relaxing facilities(29%) & sports facilities(29%), whereas esplanade(29%) was preference by the age group 30s. Two strength preferences for the age groups 40s and 50s were esplanade(33%) & trees(33%) and relaxing facilities(33%) & trees(33%) respectively.

Finally, the age group 60s wanted relaxing facilities(60%). These figures show that preferences vary according to age groups.

Thus, the results should be referred to put a priority in developing the park because they will enhance users' satisfaction when the park is developed.

(3) As for development directions of the park, 46.7% of respondents preferred the mixture of park facilities and walking trails except sport facilities(50%) by 10s, followed by a forest park (26.7%) and sport facilities, while 2% wanted it to remain unchanged, and 2.2% wanted others(fishing). This finding is meaningful enough to be considered to suggest the direction of the park for the benefits of residents and users.

(4) As for timing of the development, 44.4% reported that the park development is a little urgent and 42.2% thought it is very urgent, which means that the total of 86.6% thought it is urgent. The figure of 86.6% is overwhelmingly six times higher than 13.4% which includes the rate of those who said it is not urgent(9.9%) and the rate of those who said it can wait(4.5%), meaning that residents and users

highly looking for the park as soon as possible.

The paper is a basic study to suggest directions of future waterfront park as poor neighboring environment and coastal environment due to construction of North Port Grand Bridge and South Port Grand Bridge are required to be improved.

Even though it is difficult to turn out enough results due to a shortage of effective samples, it can contribute suggest back database for directions of the park with the pre-survey. A series of objective studies should be implemented in future. These opinions should be taken into account for developing and growing the Cheonghak Waterfront Park into a park with the interests and hopes of residents as the main users of the park.

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