# How to make dissipating blocks useful !

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Dissipating block = a block to reduce the wave power Breakwater = a block to prevent wave

## 1. Motive and Purpose

In recent years, we have bad many natural disasters in Japan. In 2011, the eastern part of Japan was hit by a powerful earthquake and a tsunami. So , we focused on the tsunami and researched the efficiency of dissipating blocks.

## 2. Hypothesis

The smaller dissipating blocks are and the more space that is in between them, the more wave power they will absorb. This is because the wave power is dispersed in small amounts, that is the dissipating blocks will have a larger effect.

## 3.Material

- Water resistant resin clay $\rightarrow$ dissipating blocks
- A plastic box $\rightarrow$  breakwater
- Oil clay , A water tank, A bucket

## 4.Experiment and Method

(1)We installed dissipating blocks and a

breakwater into a water tank.

2 We ran water powerfully to generate waves.

3 We measured

the water level

of this area and

in the back in the front

compared the power and

the height of the waves. Figure 1: Experiment equipment

## 5.1.Experiment(1)

1) breakwater only

(2) breakwater and dissipating blocks  $20g \times 20$ ,

 $10g \times 20$ 

③ breakwater and dissipating blocks  $40g \times 15$ 

#### Table 1: the average amount of water

	( <b>1</b> (mm)	<b>(2)(mm)</b>	<b>3(mm)</b>
1 <sup>st</sup>	10	5	7
2 <sup>nd</sup>	5	2	7
3 <sup>rd</sup>	7	3	5
average	7.3	3.3	6.3

### Wave height and momentum



5.2.Experiment(2)

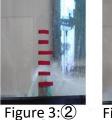




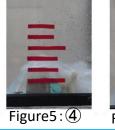
Figure 4: ③

(4) breakwater and dissipating blocks  $40g \times 20$ (5) breakwater and dissipating blocks  $40g \times 15$ (6) breakwater and dissipating blocks  $40g \times 10$ 

#### Table 2: the average amount of water

	<b>(mm</b> )	( <b>5</b> (mm)	<b>(mm</b> )
1 <sup>st</sup>	3	7	5
2 <sup>nd</sup>	2	7	5
3 <sup>rd</sup>	5	5	5
4 <sup>th</sup>	1	7	10
Average	2.75	6.5	6.25

#### Wave height and momentum







## 7.Consideration

(1) about the size comparison  $\rightarrow$  The dissipating effect of pattern2 was the largest.

②about the number comparison $\rightarrow$ The dissipating effect of pattern4 was the largest.

➡The wave power is dispersed minutely by putting many dissipating blocks because they are smaller and there is more space among the dissipating blocks.

# 8.Conclusion

However, in reality, dissipating blocks are made from concrete and they are much heavier than what we made. Also, the distance from the place where waves generate to a breakwater is much farther in reality than the distance in that at our experiments. So, we want to proceed with a large scale experiment based on the results of these experiments.