INTRODUCTION
The potential of offshore wind power in Japan is high, because Japan is surrounded by the sea on all sides. For this reason, proving research and planning of wind farms have been conducted in various locations. However the introduction is delayed compared with Europe due to severe natural conditions such as typhoons and swells unique to Japan. Offshore Choshi is one of the suitable sites for wind power generation on the Pacific side, but there is no data about characteristics of high waves required for setting the design conditions and characteristics of low waves required for the construction onsite. Therefore in this research, we aim to establish the design and construction of offshore wind farm adapted to Japan, using wave data obtained by proving research offshore Choshi, to investigate the wave characteristics for wind farm design and construction.

OUTLINE OF EMPIRICAL RESEARCH
We installed a 2.4MW wind turbine, a wind observation tower, and a set of oceanographic observation equipment 3km from Choshi city in Chiba prefecture. The depth of installation is about 11m, and the design wave height and period in storm condition is 10.51m and 14.5sec. The ocean observation period is 7 years from Jan 2010 to Dec 2016.

WAVE CHARACTERISTICS OFF THE COAST OF CHOSHI
Fig.2 shows the mean value per month. It is small in summer and winter for both wave height and period, but the variation in summer and autumn is large due to the typhoon season.

The maximum highest wave height during the observation was 9.52m and the significant wave period at that time was 13.3sec. In the disturbance Top 10 during the observation, the half were due to typhoons in summer and autumn, and the other half were due to low pressure in winter. As shown in Fig.3, we were able to capture the development process of swell and wind wave due to typhoons.

CONCLUSION
We analyzed the wave characteristics that contribute to the design and construction for wind farm, using seven years wave data obtained from proving research offshore Choshi. We confirmed the validity of design conditions for high waves and gained valuable data such as swell and wind wave development process due to typhoons. We also showed that the appearance characteristics of low waves are important in the planning of construction using small working vessels, with prospective improvement by dedicated vessels. Furthermore, by grasping the appearance characteristics of low waves, we have constructed a framework for stochastic optimum construction management in future wind farm planning.

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