

HANEDA D-Runway Report (No.10) STEEL JACKET & WELD

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TAMA RIVER WATER FLOW

D runway, as the fourth runway at HANEDA airport, is now under construction at the river mouth of TAMA River. In order not to block the water flow, the structure of a huge scale steel jacket platform of pile foundation was adopted as a base structure of the runway in the area influencing the water flow. The dimension of the new airport island is about 3,100m long and 500m wide (area: about 1.5 km²), and the part of pile foundation is about 1,100m long and 500m wide (area: about 0.5 km²).



A STEEL JACKET AS A BASE STRUCTURE OF A RUNWAY

A steel jacket, which is composed of an upper steel girder and a lower pipe truss, is a superstructure and composing a huge scale steel jacket platform. The standard dimension is about 65m long, 45m wide and 35m tall with 6 steel pipe legs of 1.8m diameter, and it weighs about 1,300 metric tons. Steel braces for lateral stiffness are arranged below water level -5.5m not to block the water flow and driftwoods, etc.

The steel jacket platform is a base structure of a runway and taxiways, and the design load by an airplane is 400 metric tons. Almost all steel plates used for fabricating jackets are thick plates, and the maximum thickness is 70mm. As these thick plates affect welding quality very much, securing fatigue strength of welded joints becomes very important issue for fabricating as well as design of a steel jacket.

On the full penetration welding of thick steel plates, which leads to 2,000km and more as the length of weld lines, the quality of welded joints is secured and controlled severely by inspecting welding faults along all weld line by using automated/manual ultrasonic testing. Here, the efficiency of AUT equipments is verified through a series of blind testing on welding faults detection for this project.

In December 2006, fabrication of upper girders of steel jackets is started mainly at factories of 1) Nippon Steel Engineering, 2) JFE engineering and 3) Mitsubishi Heavy Industry. Then, upper girders were sea-transported to 2 factories of the NSE and the JFE in Tokyo bay area, and an upper girder and a lower pipe truss are assembled there. In total, 198 steel jackets are fabricated, sea-transported to HANEDA and installed onto pre-driven steel foundation piles of about 90m long. The number of pre-driven piles is the same with the number of legs. The allowance of installation is set within +/- 10cm in plan, and within +/- 5cm in practice. The 198th final jacket has already been installed safely in January 26, 2010, and the project has entered the final stage. (To be continued)

