

## Runway extension into the sea

### Tokyo, Japan

When Tokyo Haneda International Airport was expanded, the scarcity of land made it necessary to build the new runway D out into the sea. The supporting structure of a connecting bridge to the artificial island is in direct contact with sea water. Reconciling the 100 year durability requirement with Life Cycle Cost constraints was a challenge. Organic coatings would have required regular repair and caused unacceptable maintenance cost. In the case of titanium, by contrast, initial

cost would have been prohibitive. Technically and economically, the cladding of structural steel with high-end austenitic stainless steel turned out to be an optimal solution.

For the tidal zone, a 20% Cr, 18% Ni and 6% Mo grade with a PRE value of 43 was used. Contrary to common belief, the corrosion load is highest in the part which is not permanently wet. In such recessed areas, splash water dries without rainwater washing the chloride-containing deposits away. For these conditions, a 23% Cr, 35% Ni and 7.5% Mo grade with a PRE value of 51 was found most appropriate.

The first-time application of this technique in an airport facility won the stainless steel producers the ISSF New Applications Award in May 2015.



### Details

<b>Environment:</b>	Marine
<b>Fabricator:</b>	Nippon Steel Engineering Co., Ltd and Joint Ventures
<b>Stainless steel grade:</b>	NAS354N (UNS N08354) for the upper part in the splash zone; NSSC270 / NAS185N (SUS 312L, UNS S31254, EN 1.4547) for the lower part in the tidal zone
<b>Product type:</b>	Stainless steel-clad structural steel circular hollow sections
<b>Dimension:</b>	1.2 mm (upper part), 0.4 mm (lower part)
<b>Surface finish:</b>	No 4 finish (upper part), bright annealed (lower part)
<b>Total quantity:</b>	500 t
<b>Producer or supplier:</b>	Nippon Steel & Sumikin Stainless Steel Corporation/ Nippon Yakin Kogyo Co., Ltd.
<b>More information:</b>	JSSA; Nippon Yakin Kogyo