Water pipe bridge

Hekinan City, Aichi Prefecture, Japan

When drinking water or sewage lines have to cross rivers and canals, they are often integrated into the girders of road and rail bridges or attached to them. In Hekinan, the steel water pipe of one such bridge had developed leaks and needed to be replaced. On this occasion, its capacity was increased to meet growing demand. However, the necessary larger pipe would have been impractical to integrate into the existing bridge. The municipal authorities therefore decided to erect a separate structure alongside the road bridge. The design was of the truss-stiffening type, in which the conduit has two functions: besides conveying the water, it also serves as the lower chord member of a truss. Molybdenum-alloyed grade SUS316 was used for three reasons. Firstly, this grade is known to be corrosion resistant in any usual drinking water composition. Water quality is unaffected. Secondly, under coastal atmospheric conditions the outer surfaces should be expected to be corrosion resistant. Repair coatings, which are typical of ageing steel or cast iron counterparts, become redundant. The stainless steel structure was found to be the most cost-effective option from a life cycle costing point of view. Finally, the exceptional ductility of austenitic stainless steels is an advantage in seismic conditions. Stainless steel is tougher than carbon steel or cast iron and can undergo stronger deformation without breaking. In the event of earthquakes, it is essential to maintain drinking water supply as a key element of public infrastructure. The requirement to defy both chloride-containing coastal atmosphere and earthquakes is quite typical of Japanese locations. Therefore, it is not surprising that about 40 % of all pipe bridges involve stainless steel in this country.

Details

Environment:	Coastal
Owner/developer:	Hekinan City
Stainless steel grade:	SUS316
Product type:	Welded pipe
Surface finish:	Pickled and passivated
Total quantity:	3 t
More information:	jssa.gr.jp

Click here for more stainless steel in infrastructure