

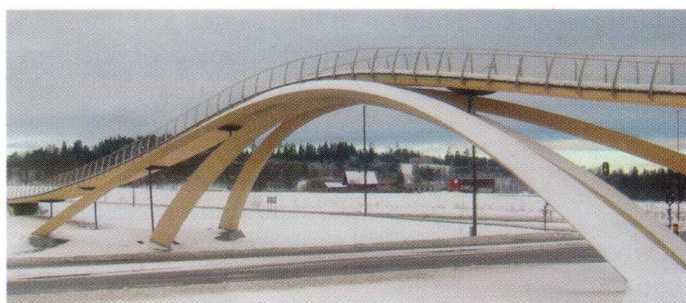
*A bridge, originally designed by Leonardo da Vinci in 1502 has been constructed in Norway using modern glulam technology. The Leonardo bridge allows cyclists and pedestrians to cross the E 18 just outside the small town of As, south of Oslo.*

The original design was for a stone construction with a massive span of 240 m to span an inlet at the mouth of the Bosphorus river but it was never built. Norwegian artist, Vebjorn Sand, saw the drawing at an exhibition of Leonardo's engineering in 1996 and inspired the Norwegian Public Roads Administration to adopt the design.

The design follows the principle that a broad-based foot to an arch can support longer spans than one of constant section – an engineering principle that was recognised some 300 years after da Vinci's drawing.

The glulam bridge is smaller than the original design with a total length of 100 m, a span of 40 m and a height above the road of 8 m. Milling the glulam to the varying cross section along the curve was a complex procedure. The outer layers of timber have been impregnated with wax to protect against crack formation and water ingress and to preserve the light colour. The components were then coated with an oil-based finish.

There are plans to build a stone bridge on the site of the old Oslo airport. This is estimated to cost three times as much as the timber one. New York city is reported to be considering using the bridge in its rebuilding of the World Trade Centre site and Vebjorn Sand has ambitions to get a Leonardo bridge built on every continent.



Vision: Leonardo da Vinci, Vebjorn Sand  
 Architects: Selberg Arkitektkontor  
 Engineers: Reinertsen Engineering  
 Glulam fabricators: Moelven Limtre.

Further information from [www.vebjorn-sand.com/thebridge.htm](http://www.vebjorn-sand.com/thebridge.htm) and [www.nordicinnovation.net](http://www.nordicinnovation.net)

Photos courtesy Terje Johansen (top), Moelven (right), Fred Evans, Norwegian Institute of Wood Technology (left).