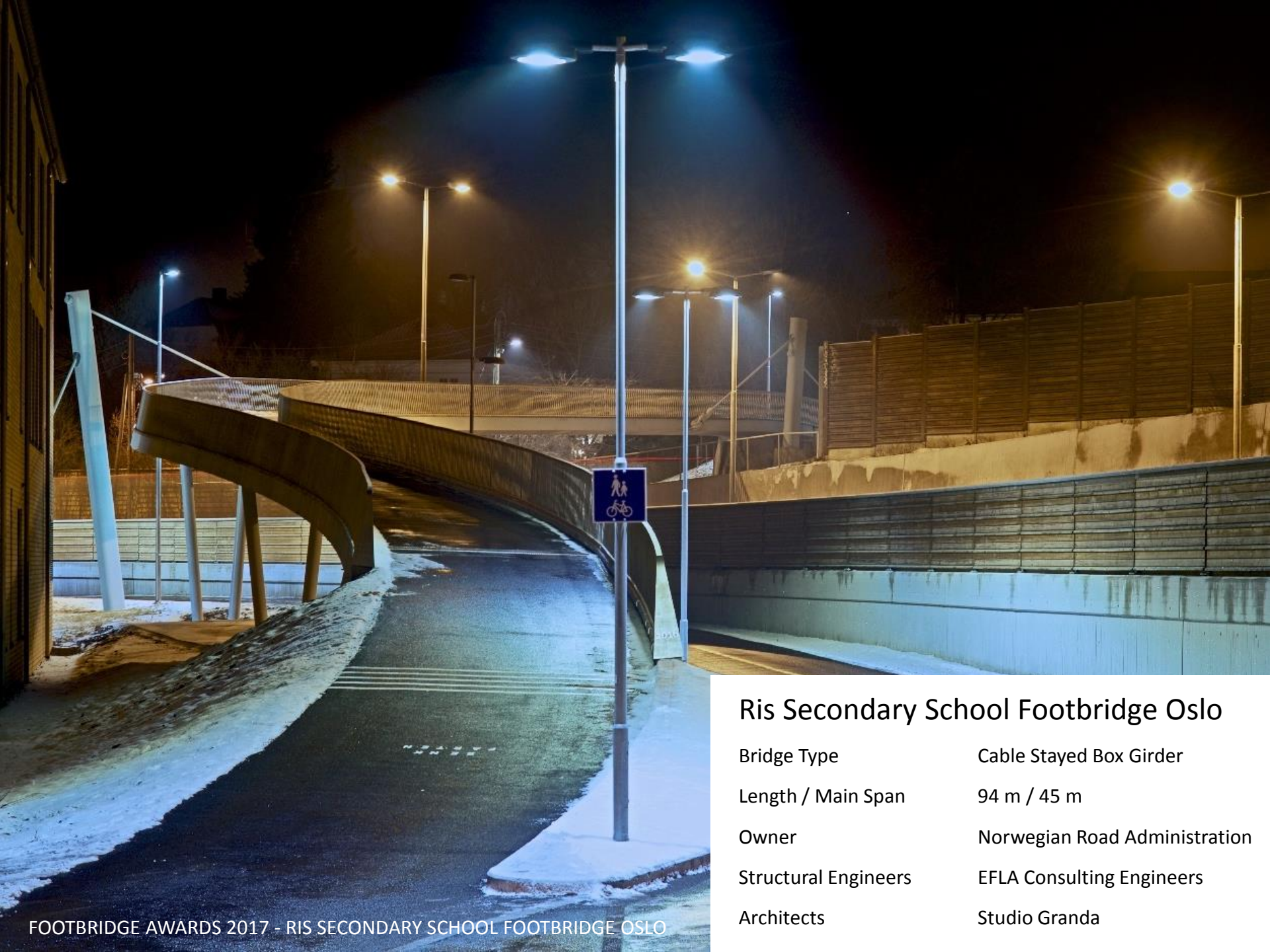


FOOTBRIDGE AWARDS 2017 - RIS SECONDARY SCHOOL FOOTBRIDGE OSLO

Ris Secondary School Footbridge Oslo

Bridge Type	Cable Stayed Box Girder
Length / Main Span	94 m / 45 m
Owner	Norwegian Road Administration
Structural Engineers	EFLA Consulting Engineers
Architects	Studio Granda

Overview

The new footbridge at Ris Secondary School in Oslo was opened in July 2016. It is a cable stayed steel box girder bridge that crosses the heavily trafficked five lane Ring 3 motorway in the northern part of the city. The total length of the bridge is 94 m between abutments with a 45-m cable stayed main span.

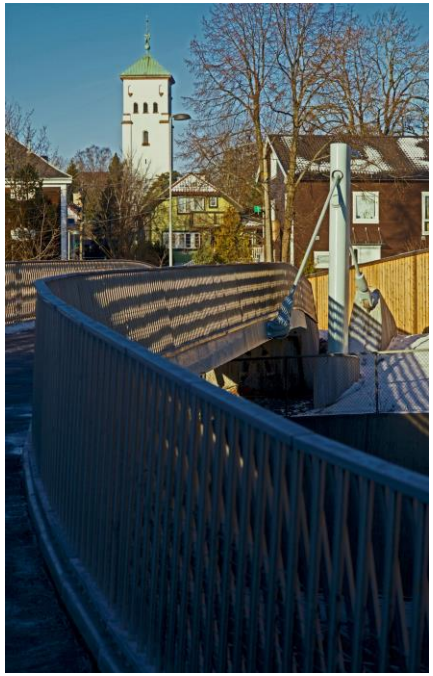
The bridge is part of a much larger initiative to improve the primary network of cycle routes in the city and as well as crossing the Ring 3 motorway, the main span of the bridge also spans a new primary cycle path along Ring 3. The finished project greatly improves the efficiency of the cycle and pedestrian networks in this part of Oslo.

Background

Ris Secondary School is located adjacent to the bridge site on the south side of Ring 3 in north Oslo. The bridge construction was undertaken in parallel with the expansion of the school facilities to the delight of the school community as many of the pupils reside in the area north of Ring 3. Furthermore, the works have significantly cleared up the area, which previously had fills and bridge abutments encroaching on the road as can be seen in the figure below.

The planning stage for the new bridge and the adjoining network of cycle and pedestrian routes was concluded at the end of 2009. The preliminary plan assumed a post-tensioned concrete bridge with a pillar between Ring 3 and the cycle path on the south side. By altering the bridge type the design team was able to lengthen the main span of the bridge, avoid a pillar at this location, and create a slender, more free-flowing construction.

It should be noted that for reasons of traffic safety the Norwegian Road Administration now favours steel bridges when construction works take place over roads. A 40-m long section of superstructure was in this case successfully erected during Easter weekend 2016, coinciding with a scheduled road closure due to maintenance works at a nearby tunnel.



Photos of the completed bridge
by Nils Petter Dale

Bridge features

The bridge has four spans, 12+17+17+45 m. In addition, the ends of the superstructure are supported by jointed steel columns that are moved inwards from the face of the concrete end abutments at the south and north ends of the bridge respectively. The superstructure is a box girder, total width 4,3 m and a construction height of 0,5 m, weighing around 1 tonne/m, which is light for a bridge of this size. The dynamic characteristics of the bridge were assessed according to SÉTRA guidelines for pedestrian comfort.

The jointed column configuration at the end supports eliminates the need for structural bearings, thus reducing inspection and maintenance costs. The intermediate pillars are pairs of circular hollow columns in a V-shaped configuration. These columns are cast in concrete foundations and fully welded to the underside of the superstructure.

The main span of the bridge is supported by Ø80 locked coil cables. A single cable connects the superstructure to oval cross section towers at either side of Ring 3 in a mono cable stayed configuration wherein cables from the north and south towers connect to opposite sides of the superstructure. The north tower is perched on the embankment and the significantly taller south tower is in close proximity to the new cycle path Consequently, the towers and cables are accessible and their robustness, solidity and structural function can be experienced at close quarters in contrast to the slender form of the bridge deck.

The guardrailing is a bespoke, modular design fabricated in maintenance free stainless steel. It consists of 1-m long elements that slide into place onto bolts fixed to the topside of the edges of the superstructure. Each element has a total of 14 pieces of Ø25 mm rods with a top rail The height of the handrail is 1,2 m above the surface of the footway. It is stiff, robust, and relatively massive when viewed as a pedestrian, providing a sense of safety and security when crossing the busy road below. Conversely, when viewed from the road the handrail is open and light in tune with the visual delicacy of the bridge deck.

The area has a rich mix of architectural styles from many periods, which are cut by the roaring traffic and vehicular management infrastructure of Ring 3. With its sinuous form and play of weight and weightlessness the bridge attempts to trace a palpable path, between the area's built history and from one side of the road to the other.

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