

Inkeroinen Bridge

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INKEROINEN BRIDGE

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REBUILDING OF THE INKERoinEN BRIDGE

To increase the capacity of the Inkeroinen bridge and to meet the traffic needs and requirements of the local service Roads and Waterways Administration made a decision to renew it under a tight schedule.

Based on technical and economic studies and findings on the central location of the bridge the following design criteria were achieved:

- the bridge was to be built in the same position as the old;
- wherever possible the existing bridge foundations were to be used;
- provision was to be made for the canalization of the Kymijoki river;

Solution

The bridge is a continuous composite girder bridge (steel girders and reinforced concrete deck).

Beams are of weathering steel with erosion factor of 0.5 mm on each surface. The steel girder is so designed that the side spans are flat and connected to an openable bridge when canalization occurs.

At the intermediate supports the web of the beams is 180 mm high and 18 mm thick. Height-span ratio is 1/28.

The deck was casted without construction joints using retardants.

In existing pillars the old bearing settings were removed and new heavily reinforced ones casted in their place.

Dimensions appear:

41 m long Ferk	2170 Ferkim
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Steel Structure	273000 kg.
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Deck Concrete	585 m ²
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Deck Reinforcement	0.31 m ² /m
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Foundation Concrete	136000 kg.
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Foundation Reinforcement	230 kg/m
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Concrete	188 m ³
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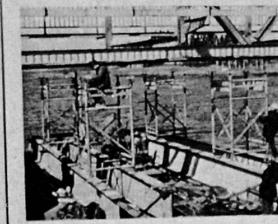
Foundation Reinforcement	13800 kg
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The New Bridge, a composite structure

Span: 29 + 65.4 + 28 m

Width: 2.75 + 7.5 + 2.75 = 12.0 m



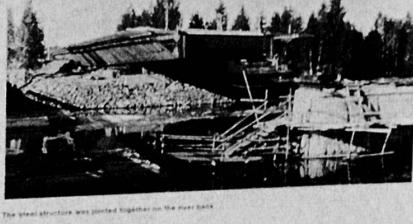
Demolition of the old steel truss bridge in progress



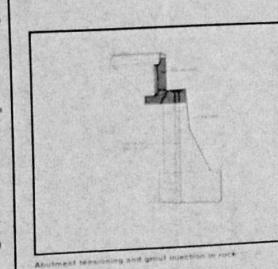
Two of the old intermediate pillars were removed



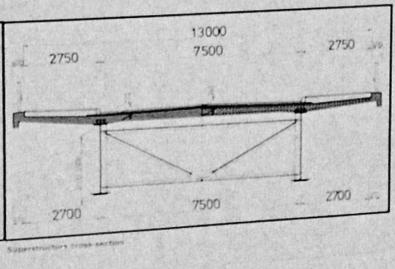
Bearing settings of remaining pillars were strengthened



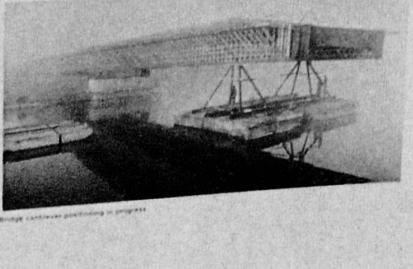
The steel structure was plated together on the river bank



Abutment backfilling and grout injection in rock



Spanner cross-sections



Bridge cantilever positioning in progress



INKEROINEN BRIDGE

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THE REBUILDING OF THE INKEROINEN BRIDGE

1. GENERAL

To increase the capacity of the Inkeroinen bridge and improve the level of service, RWA made the decision to renew it under a tight schedule. Based on technical and economic studies and further on the central location of the bridge the following design criterions were achieved.

- the bridge was to be built in the same position as the old,
- wherever possible the existing bridge foundations were to be used,
- provision was to be made for the canalization of the Kymi river.

2. SOLUTION

2.1 A Steel beam structure

The bridge is a continuous composite girder bridge (steel girders and reinforced concrete deck). The steel framework is formed of two parallel beams joined together by crossbeams at 6600 mm centres. Beams are of weathering steel with erosion factor of 0,5 mm on each surface. The steel structure is so designed that the side span can be cut when canalization occurs. At the intermediate supports the web of the beams is 2400 mm high and 18 mm thick. Height-span ratio is 1/28. The steel structure was jointed together on the river bank and pulled to its final position.

2.2 The Concrete Deck

Automatically welded bolts, ø 19 mm, serve to join the concrete to the steel. Thickness of deck slab between the beams is 210 – 340 mm. At the support in the negative moment area the amount of non-prestressed steel is over two percent of the deck cross-section because of crack-width limitations. The deck was casted without construction joints using retardants.

2.3 Foundations

The condition of the existing foundations was checked by core sampling. Two of the intermediate pillars were removed totally and in remaining pillars the old bearing seatings were removed and new heavily reinforced ones casted in their place. The abutments and the fixed bearing pillar were stressed with rock anchors to ensure a sufficient capacity. By using the existing foundations constructing in water was completely eliminated.

3. COSTS AND QUANTITIES

Costs of the project were approx. 4,1 Million Fmk.

Steel Structure	273000 kg	145 kg/m ²
Deck Concrete	585 m ³	0,31 m ³ /m ²
Deck Reinforcement	136000 kg	230 kg/m ³
Foundation Concrete	188 m ³	
Foundation Reinforcement	13600 kg	