

Various information on network arches

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Abstract

Network arches are light, elegant and economical bridges. They will normally have no dangerous vibrations due to wind. Light steel skeletons with tubular arches can be used when erecting network arches. Before the concrete tie is cast, the arches are filled with concrete. Polymer threads under the tie can be used for counteracting deflections and strengthening concrete ties.

Keywords: Network arches; suspension bridges; concrete; prestressing; vibrations; erection; deflections; polymer

1 Introduction

Those that accepted this contribution suggested that the author concentrate on the network arch. This has been done.

2 The first network arch

When the author was working on his master's thesis in 1955, he suggested an arch bridge that he later called a network arch. This is an arch bridge where some hangers cross each other at least two times.

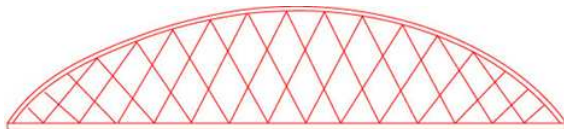


Fig. 1. Suggested network arch from the author's master thesis

3 The Brandanger Bridge

The network arch was chosen for the Brandanger Bridge because a prestressed concrete bridge would have been much longer. The side spans would have reached far inland, especially on the east side of the main span.



*Fig. 2: The Brandanger Bridge was built in 2010.
60 km north of Bergen, Norway*

The main span was 220 m. It was built on a plane where rock had been taken out for covering pipelines in the North Sea. If we define the slenderness of an arch bridge as the span divided by the sum of the height of the tie and the arch, then the Brandanger Bridge is the world's most slender arch bridge.



Fig. 3. Building of main span