Innovative Technology at the Deconstruction of Bridges

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Summary

Special methods had to be developed for the deconstruction of two bridges in the course of the widening of the motorway A7 in Hamburg. At one bridge blocks of ultra high strength concrete with steel fibres are used as temporary anchoring of the prestress tendons. At the other bridge the old concrete superstructure is removed by a special incremental launching backwards.

Keywords: bridge deconstruction; temporary anchors for internal prestress; ultra high strength concrete; fibre concrete; deconstruction by incremental launching.

1. Introduction

In the course of the widening of the motorway A7 in Hamburg, many and extensive structures have to be removed and rebuilt. At the deconstruction of two bridges some complicated problems emerged and innovative solutions were developed. At one bridge high strength fibre concrete blocks are used as temporary anchoring for the internal prestress. At the other bridge the old concrete superstructure is removed by a special incremental launching.

2. Overview on the Widening of the Motorway A7 in Hamburg

The widening of the motorway A7 is the major infrastructure project in Hamburg currently. The project includes about 20 km motorway with 9 city interchanges and 2 motorway interchanges. Up to 4 lanes have to be added, resulting in the complete rebuilding of the existing motorway. In the central part are built ten driving lanes with two emergency lanes for the predicted traffic volume of 170000 Fz/d.

The existing motorway A7 was built in the period about 1970. At that time, functionality of the traffic and rapid completion had first priority. Competing aspects, like the life quality of the neighbourhood, the conservation of ecological and economic networks or the growth advancement of a consistent urban life did not find consideration. Besides, life time efficiency or sustainability of the structures did not find first interest, either.

Following the requirements and legislation of today, especially the limitation of traffic noise levels, three tunnels with a total length of 3600 m have to be built. The width of the tunnel tubes will be about 25 m, up to now without example (*Fig.1*). Furthermore, about 10 km of noise barrier walls have to be built. In sections, these walls will be built cantilevered and have heights of 9 m (*Fig.2*).

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