



## Engineering structures for the CNM HSL

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### Abstract

This paper presents an overview of engineering structures for the Nîmes-Montpellier Bypass (also called CNM, French acronym of Contournement Nîmes-Montpellier), which involves the design, execution and maintenance of the first dual-track, mixed high-speed passenger and freight rail corridor in France. With a total length of 80km, including 20km of connections to existing lines, this bypass includes 183 engineering structures: 12 viaducts, 1 cut-and-cover tunnel and 170 standard engineering structures. Overall, 4 years were necessary to build the CNM HSL, including 2.5 years for civil works and a total of 320,000m<sup>3</sup> of concrete, 55,000T of steel reinforcements and 15,250T of steel frames were used. The line was opened at the end of 2017 and the maintenance is guaranteed until 2037 by the public-private partnership contract.

**Keywords:** Mixed high-speed passenger and freight railway line; viaducts; cut-and-cover tunnel; standard engineering structures; structural design; construction methods; public-private partnership.

### 1 General overview

The Nîmes-Montpellier Bypass (CNM) aims to connect Nîmes and Montpellier to the French high-speed rail network and to relieve the existing tracks of heavy freight traffic. The Oc'Via Joint-Venture was awarded the contract by SNCF Réseau (former Réseau Ferré de France) in 2012 under a 25-year design, build and maintain public-

private partnership (PPP) scheme. The project layout in Gard and Hérault departments is presented in the Figure 1.

This rail line is located in a region known for its highly sensitive hydraulic environment. Numerous engineering structures were planned to achieve hydraulic transparency, which means that the works undertaken allow water to pass under the built structures, without affecting its solidity.