

# Sophia Rail Tunnel, Oud-Alblas/Papendrecht

**Client:** NS Railinfrabeheer  
**Design:** Betuwe Route Management Group – NS RIB / Grontmij / De Wegener (consortium) / BAM Infraconsult  
**Construction:** Tubecon 1 Consortium (BAM Civiel bv / Heijmans / Philipp Holzmann / Hochtief / Kon. Boskalis)  
**Contract value:** € 303.730.000 (23%)  
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## BAM Civiel

The Betuwe Route is a double-track goods line connecting the Port of Rotterdam directly with the European hinterland. It reinforces the Netherlands' position as a transport and distribution country without having an excessive impact on the environment.

The Betuwe Route has two distinct parts. The first is the 48-kilometre Havenspoorlijn. The second runs from the Kijfhoek shunting yard to Zevenaar near the German border. This new 112-kilometre section generally follows the route of the A15. The line runs through concrete troughs and tunnels, over flyovers and bridges on its way through the landscape. The Sophia Rail Tunnel is situated in this second part. BAM Civiel is the main contractor and sponsor for this design and construct project.

The eight-kilometre stretch of line goes under the Noord and Rietbaan rivers and the island of Sophiapolder that lies between them. It also crosses the A15 and A16.

Around four kilometres are bored, two kilometres are being built using the open construction pit method, and two access ramps are set in cuttings.

The bored tunnel consists of two separately bored tubes 4.7 kilometres long with an external diameter of 9.8 metres. Each single-track tube can therefore accommodate trains with loads up to two containers high. The tunnel is bored using the continuous boring technique, which means that boring does not have to be interrupted for the tunnel rings to be installed. The cutter head is moved forward by jacks that push against the previous ring, so to put a ring in position, jack cylinders have to be retracted. With continuous boring, the increased pressure forces due to the retracted jacks are compensated by the other jacks. The boring machine housing is extended and the ring design adapted. The logistics of the process and the measurement and control systems are also adapted to create the conditions required for continuous boring.