



ITA TUNNELLING
AWARDS 2019



Victory Boogie Woogie Tunnel

The Netherlands

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The Hague

- City by the Sea
- Home of the Dutch Government and Parliament
- International City of Peace and Justice
- Home of the Peace Palace and the International Criminal Court
- Home of the Dutch Royal Family
- Home of the Victory Boogie Woogie painting by Piet Mondriaan





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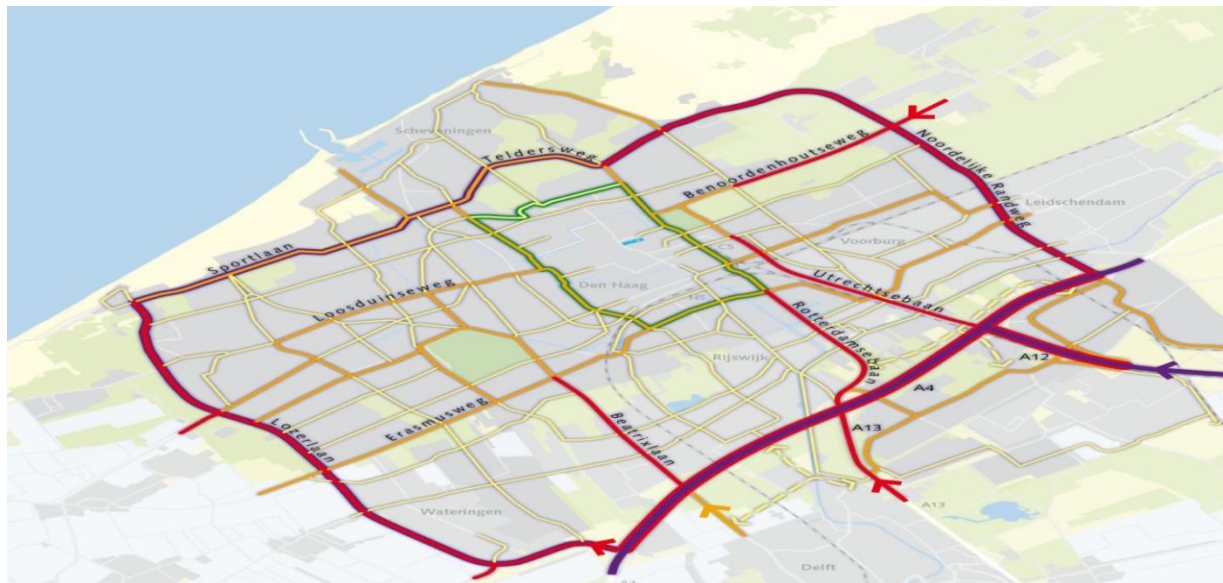




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- Due to its coastal location, The Hague has no closed traffic circle.
- Accessibility in the direction of the city center from Rotterdam with its port is vulnerable.
- The solution is a new connection between Rotterdam and The Hague!





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This connection passes over the remains of an ancient Roman settlement:
Forum Hadriani.

The logical solution is therefore a bored tunnel.

Despite:

- soft subsoil consisting of sand, clay and peat
- groundwater table near to the surface
- presence of a river and a city port

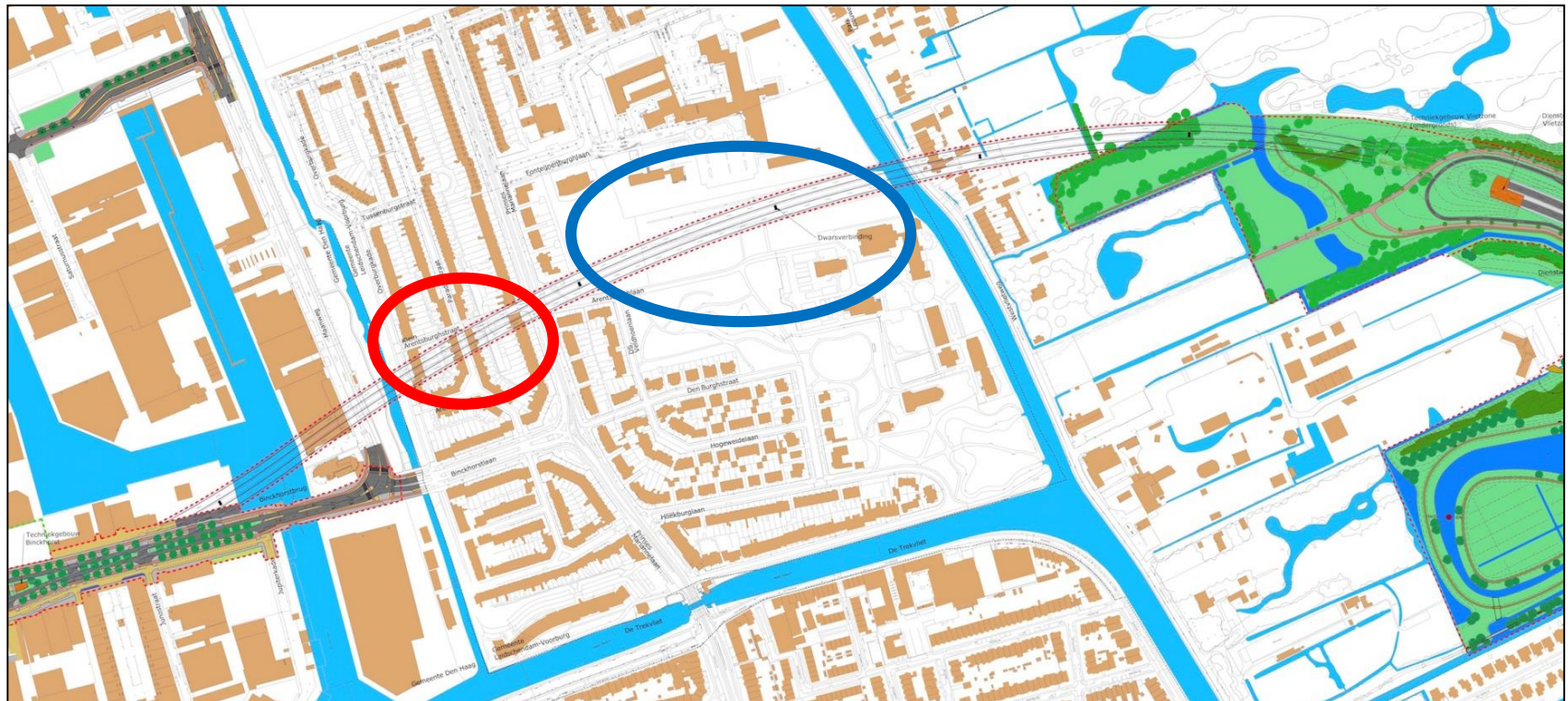


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The combination of residences above the tunnel track and the soft soil poses a further challenge.





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Monitoring

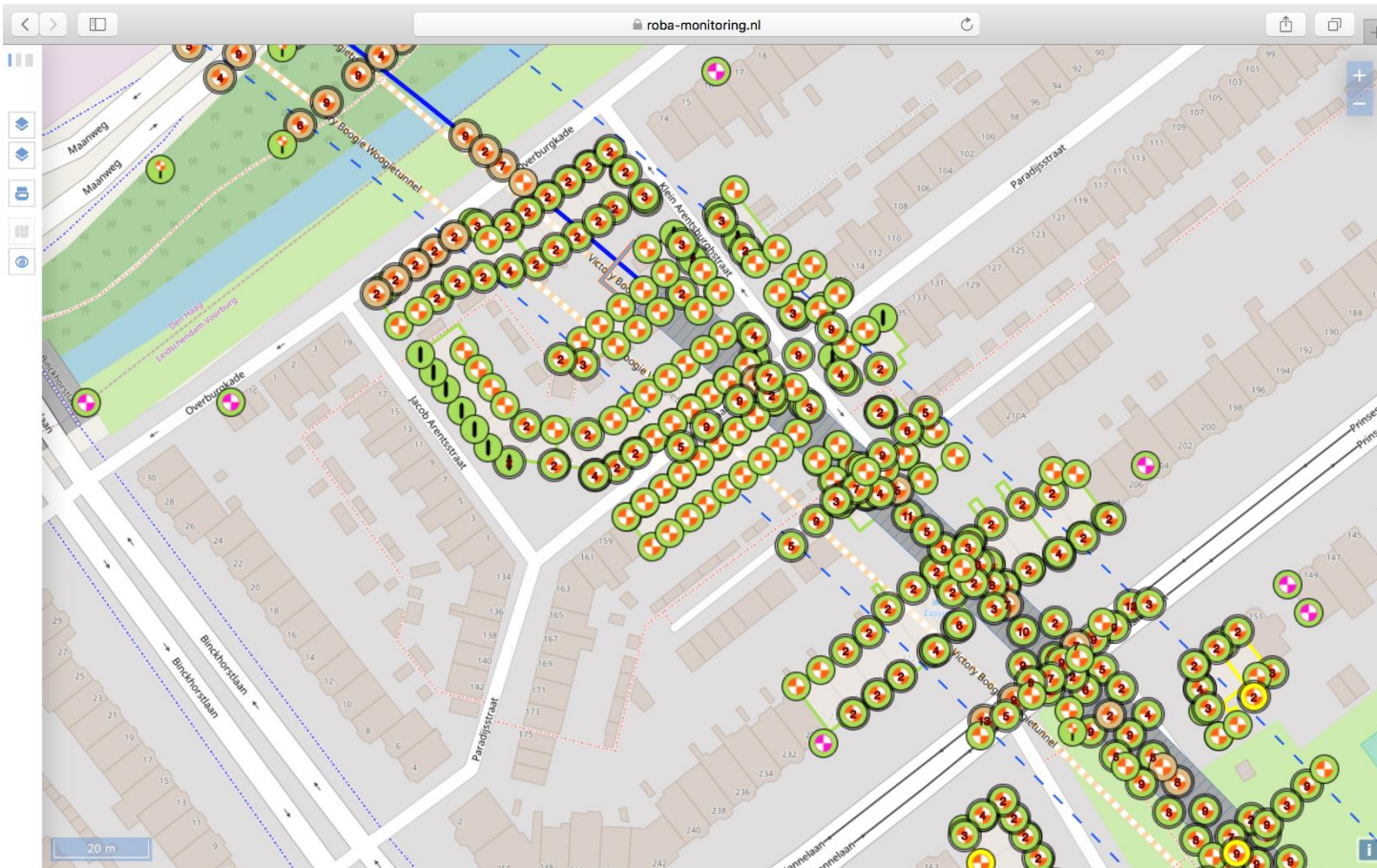
An intensive monitoring program combined with the craftsmanship of the TBM team resulted in a settlement of the surface of max 4 mm.

- 38 Robotic Total Stations
- 6000 prisms installed
- 200 million data points





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Facts and figures

- The 2 tunnel tubes are 1,640 and 1,636 meters in length.
- The deepest point of the tunnel is -31 meters below surface.
- A concrete weight slab in front of the end slab made it possible to bore very close to the surface, creating a longer tunnel.
- After boring the first tunnel tube, the TBM was transported back to the reception shaft through the city and by ship over the river.
- 6 cross connections, constructed with freezing technique.



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**BORING
THE VICTORY
BOOGIE WOOGIE TUNNEL**



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Rotterdamsebaan kaart x + -

https://www.waarisdeboor.nl/update/

Aanbevolen websites ☆ Galerie Webslices

Rotterdamsebaan LAATSTE UPDATE 27-06-2018

TUNNELBUS **VOORTGANG**

Tunnelbus Oost **1639** VAN 1640 METER

Meer info

Map navigation icons: Home, Full Screen, Zoom In, Zoom Out, Street View, Layers, Print, Share

Livestream aankomst boormachine

↑ Mijlpalen

Meer informatie →

Vorbereidingen doorbraak gestart

⚠ Wetenswaardigheden

Meer informatie →

Volg de doorbraak

⚠ Wetenswaardigheden

Meer informatie →

De laatste 100

⚠ Wetenswaardigheden

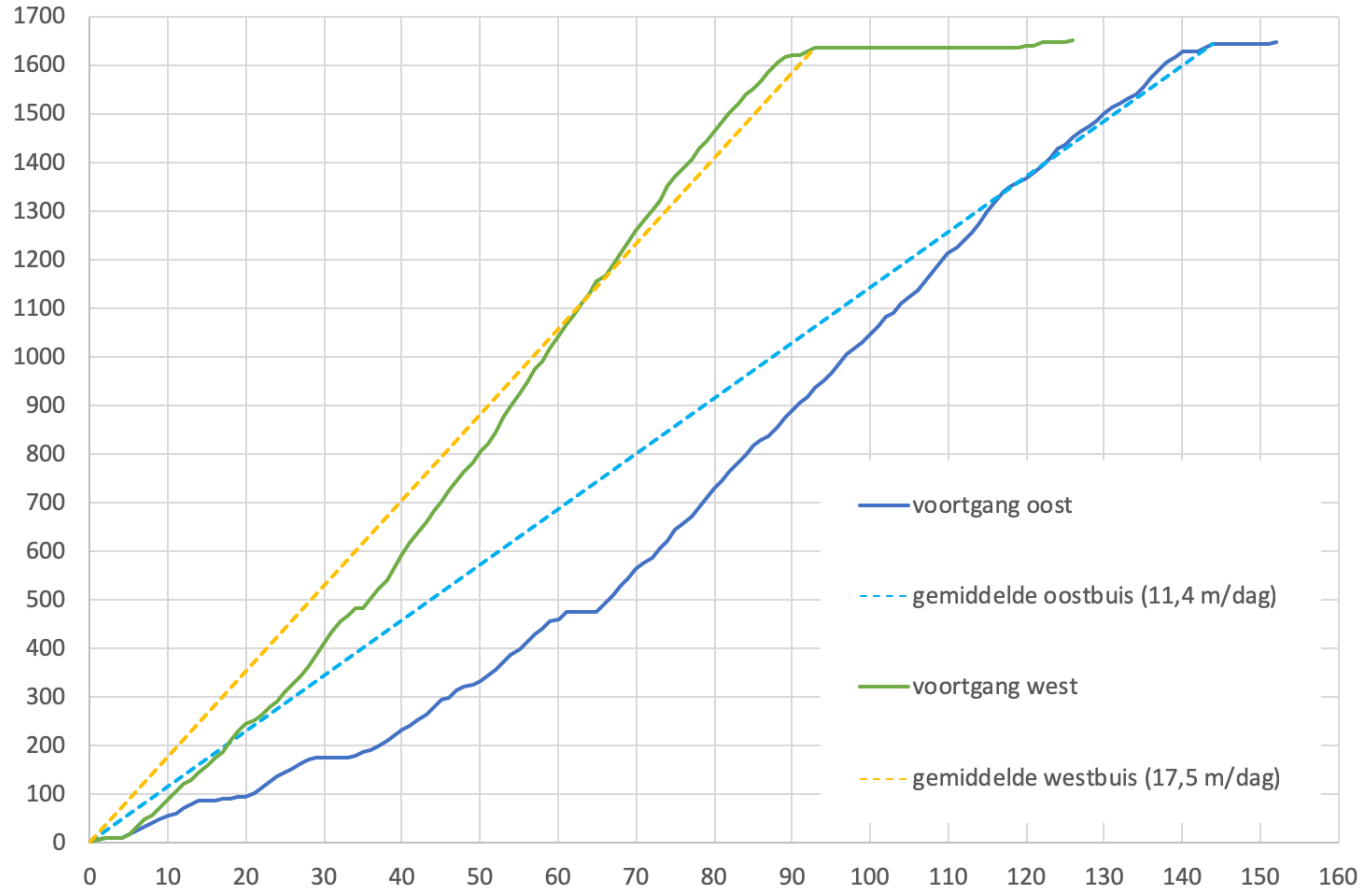
Meer informatie →

Google

Kaartgegevens ©2018 Google Gebruiksvoorwaarden Een kaartfout rapporteren



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Sustainability

- Roof above the entrance is made of solar panels
- 60% less energy consumption
- Fine Dust Reduction System collects 50% of fine dust produced in the tunnel
- Low Energy Asphalt with PA stone
- Transportation of lining elements by battery-operated vehicles, a world scoop ('Tunnel-Tesla')





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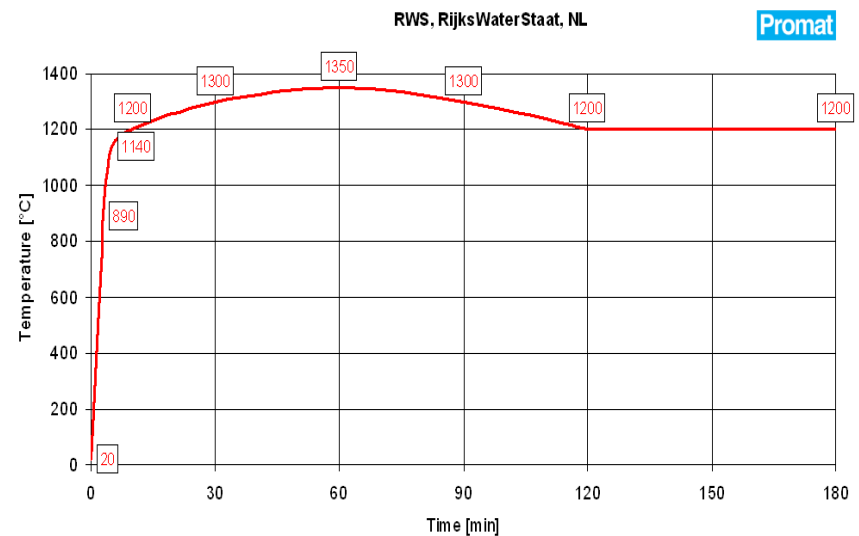
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Fire resistance

The lining elements contain polypropylene fibers.

Test results show that the tunnel meets the highest fire safety standards for traffic.



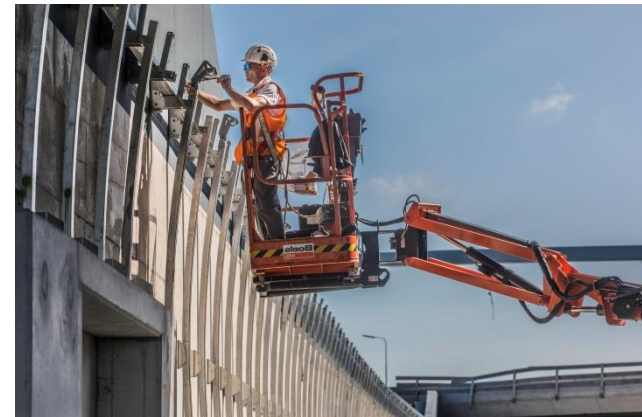


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Safety on site

- Safety awareness training for all employees, also for sub-contractors
- Safety check at the start of each shift
- 645,000 hours worked on building the tunnel
- No fatalities
- 2 incidents with (short) absence, LTIF 3.0
- 16 lost working days, TLWR 24.0





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Conclusion

In the summer of 2020, traffic will drive through the tunnel

- Beneath an ancient Roman settlement
 - Beneath residences and under a river and port
 - Through very weak soil
 - In a very safe, beautifully designed and sustainable structure
 - Towards the International City of Peace and Justice
-
- The **VICTORY BOOGIE WOOGIE** TUNNEL



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Project initiated / built by:

- Client: Municipality of The Hague
- Contractor: Combination Rotterdamsebaan
joint venture by BAM & VolkerWessels
- Engineer: Movares
- Architect: Benthem&Crouwel / Paul de Ruiter
- TBM supplier: Herrenknecht AG