

## M49 Avonmouth Junction



The project re-engineered a section of the M49 motorway by delivering a new grade separated junction, providing direct access for the port of Avonmouth and the Severnside Enterprise Area, which is one of the largest brownfield sites in Western Europe. The network consists of four new slip roads and gyratory, including the re-use of an existing overbridge, which had to be built on embankments up to 11m above natural ground level.

- **Date of completion: Dec 2019**
- **Cost: £36m**
- **Location: Severn Beach, Bristol**

### Challenges and solutions

Complex ground of very soft alluvial deposits up to 10m thick with a consistency of 'toothpaste' made the construction of the embankments very challenging, resulting in innovative solutions. A conventional piled embankment solution would have been slow to construct, with a significant carbon and environmental impact.

Instead, reinforced soil embankments and a ground improvement alternative to traditional piling, using both Controlled Modulus Column (CMC) rigid inclusions and prefabricated vertical drains were used. This innovative ground improvement solution was critical to the project's success and provided significant programme savings. The early involvement of specialist sub-contractors enabled the design to develop efficiently with fewer changes and therefore lower costs.

Disruption for the local community and network users during the works was minimised through the South West's first trial of 60mph speed limit (normally 50mph) which had a positive impact on the levels of speed compliance by road users. The junction works were completed in December 2019, whilst full opening to traffic will follow the separate Farm Lane highway connection enhancements.



## Benefits and achievements

The project delivers a key new access into the Avonmouth and Severnside economic zone which will allow these areas to thrive, easing congestion and contribute to the overall region's economic growth through new economic activity and employment in diverse sectors. This will have a significant impact on the local area, which is expected to attract 14,000 new jobs, explaining the project's phenomenally high benefit cost ratio of 32.

HGV's using local roads will be vastly reduced when traffic is fully diverted onto the junction, improving traffic flow and noise for the local communities. The project provides connectivity over the M49 for National Cycle Network Route 4. The pedestrian route and bridleway through the site remained segregated and open for the project duration.

Recycled aggregate for the embankments was sourced from a local supplier, reducing haulage and significantly reducing the amount of new fill. The project was completed with full appraisal of the local ecology ensuring positive outcomes wherever possible, including a reptile translocation programme to move protected slow worms and grass snakes to a nearby receptor site.



## Fascinating facts

- ❑ The new junction will initiate development of one of the largest brownfield sites in Western Europe, with up to 14,000 new jobs.
- ❑ Approximately 9,000 concrete ground improvement 'columns' were installed to support the junction.
- ❑ Overall embankment volumes of less than 60% of a traditional solution were achieved through an innovative design that vastly reduced HGVs loads.

## People who made it happen:

- Client: Highways England
- Designer: Arup
- Principal Contractor: Galliford Try
- GI Specialist Contractor: Vibro Menard

## More about this project:

[highwaysengland.co.uk/projects/m49-avonmouth-junction/](https://highwaysengland.co.uk/projects/m49-avonmouth-junction/)