The access ramps zigzag gently downward within a tight footprint, supported by TensarTech TW3 retaining walls

Walls & Slopes
№ 485

A47 Longthorpe Footbridge

Peterborough, UK

CONSTRUCTED IN 2022

Accessibility delivered with a lightweight, compact structure

This TensarTech structure combines complex geometry and lightweight fill to create wheelchair friendly shallow access ramps within a very restricted space, constructed with minimal disruption, and without the need for expensive foundation works.

Benefits

No piles or deep foundation required
due to the use of reinforced structures with lightweight structural fill

Major road remained open throughout
- construction of the TensarTech TW3 walls required no deep excavation, enabling the A47 to remain open

Fewer trees removed
due to the compact construction footprint made possible by the zigzag ramp design and construction method

Aesthetically attractive structure
- important for this large, highly visible structure in a residential area

CLIENT'S CHALLENGE

The existing footbridge had become costly to repair. National Highways decided on a replacement and committed to improve accessibility for cyclists, walkers, and wheelchair users. The site contained mature trees and the client wanted to remove only the minimum that was necessary. Ground conditions were variable, the potential for differential settlement between the ramps and piled abutments was a concern. In addition to this, the busy A47 had to be kept open throughout as well as the exiting footpath, due to the bridge being heavily used by school children and their parents. The site was very restricted as only two sides of each ramp had good access to build the walls.

TENSAR SOLUTION

TensarTech TW3 wall construction was adopted to support the access ramps. Using a zigzag geometry, 3.5m wide ramps were built with a gentle 1:20 gradient, all within a very tight construction footprint. By using lightweight aggregate for the reinforced fill, bearing pressure was minimised, avoiding the need for deep excavation or piled foundations.

TensarTech TW3 solution with lightweight fill avoided deep foundations without concerns of differential settlement between ramps and piled abutments

PROJECT BACKGROUND

The A47 is a busy trunk road between Peterborough and Great Yarmouth. An existing footbridge located at Longthorpe, Peterborough, connected residential areas either side of the A47 Soke Parkway. The bridge had become expensive to maintain and out of specification, leading National Highways to decide on a replacement.

The new bridge would be just 5m from the existing footbridge. The client committed to improve accessibility for cyclists, wheelchair users and those pushing prams. This required wide, shallow access ramps. Both ends of the bridge have well established trees. National Highways wanted to keep as many of these in place as part of their commitment to environmental and biodiversity goals.

By proposing a zigzag geometry, Consultant, MMSJV could keep the 5m wide, 1:20 gradient access ramps within a tight footprint, minimising tree loss.

Apart from limited weekend closures, the A47 needed to be kept open throughout. Main Contractor, GRAHAM needed a solution that would not require piled foundations or deep excavation. The foundation soils were variable presenting bearing capacity problems and the potential for differential settlement between ramps and the bridge abutments.

Having worked with the Tensar team on previous projects, GRAHAM approached Tensar for a proposal.

The Tensar solution combined the TensarTech TW3 retaining wall system with a Leca® lightweight aggregate structural fill. This solution met the requirements for a compact footprint, and the low bearing pressure avoided the need for deep foundations. GRAHAM and the project team including National Highways liked the proposal and engaged Tensar to design and supply the TensarTech system.

GRAHAM completed the works on schedule and the new bridge was opened to the public in February 2023.

Client
National Highways

Consultant
MMSJV

Contractor
GRAHAM

Installer
Phi Group

"The shallow ramps had to fit within the tight constraints of the site. We needed a solution that could avoid deep foundations without causing differential settlement between ramps and the piled abutments"

Tom Higgins
Site Agent
GRAHAM

