



3-span overbridge supported on TensarTech TW3 bridge abutments over the M42 motorway (photo credit: Highways England)



Walls & Slopes Nº 491

M42 Junction 6 Improvements B4102 Solihull Road Overbridge (BR01)

📍 West Midlands, UK

CONSTRUCTED IN 2022

Benefits

No departure from standard
was required for the TensarTech system

Reliable partner
– From previous collaborations, Skanska knew they could trust Tensar's design service and delivery.

Optimised design
from Tensar provided the most economical solution for this major structure.

Lower carbon solution
compared to RC abutments, which aligns with National Highways carbon cutting objectives.

Tensar bridge abutment solution for triple-span bridge

Solihull Road overbridge is a triple span structure crossing the M42 motorway. The 122m long deck is supported at each end on bank seats bearing on TensarTech system reinforced soil abutments. This is the longest fully integral bridge on reinforced soil abutments in the UK.

CLIENT'S CHALLENGE

The bridge design comprises a 3-span multi-girder steel/concrete composite deck, simply supported on bank seats. A proven reinforced soil abutment system was required to carry the high vertical loads. The abutment structures needed a certified 120-year life and to address the clients demands for lower carbon solutions

TENSAR SOLUTION

Tensar was engaged by the main contractor, Skanska to look at the bridge abutment design, following successful collaboration on similar schemes. Tensar proposed the TensarTech TW3 wall system for the abutments and wing walls. Working closely with Skanska's design partner Mott McDonald, Tensar took responsibility for the design of the reinforced soil structures. TensarTech system components were then supplied by Tensar.



Demolition of the old bridge after opening of the new adjacent overbridge (photo credit: Highways England)

PROJECT BACKGROUND

Major improvement works for Junction 6 of the M42 motorway required replacement of an existing overbridge carrying the B4102 over the M42. The new bridge needed to be significantly longer, crossing the motorway and two new slip roads serving the new Junction 5a.

The bridge design comprises a multi-girder steel/concrete deck with 3 spans, totalling 122m in length. The decision was made to use reinforced soil abutments and wingwalls to support the bank seats, based on cost, speed of construction, and carbon cost. The lower carbon footprint of this type of construction, when compared to RC retaining walls, aligned with the carbon cutting targets of the client, National Highways.

Skanska appointed Tensar for design of the reinforced soil abutments and wing walls, having successfully collaborated on previous highway schemes. Tensar worked closely with Mott McDonald, Skanska's design consultant, who had overall design responsibility for the bridge works.

Tensar proposed their TensarTech TW3 wall system with a precast concrete block facing, combined with Tensar uniaxial soil reinforcement geogrids. The system has BBA/HAPAS certification. Construction of the TensarTech TW3 structures was completed by PC Construction.

The new bridge was completed on time with the deck lifted in place in June 2023.

Client

National Highways

Contractor

Skanska

Contractor Design Consultant

Mott MacDonald

Sub-Contractor for TensarTech TW3 Wall Construction

PC Construction

"Communication and collaboration between engineers at Skanska, Mott McDonald and Tensar's design team has been excellent for this structure and the other structures where we were involved for this project."

"Being part of the design team from an early stage, really allowed us to offer the best solution to meet the client's needs. That is always very satisfying."

Chris Dibbs

Design Engineer
Tensar

Bridge Details:

| TensarTech System | Abutment Loading | | Bridge bankseat type | | | Bridge function | | Spans | Total deck length |
|-------------------|------------------|--------------|----------------------|---------------|----------|---------------------------|-----------------------|-------|-------------------|
| | Non-load bearing | Load bearing | Simply supported | Semi-integral | Integral | Over Structure | Under structure | | |
| TensarTech TW3 | | X | X | | | 2-lane single carriageway | M42 plus 2 slip roads | 3 | 122m |