Construction of Tied Arch Road Bridge, Newport, Wales

Client: Morgan Vinci JV
Consultant: Faber Maunsell
Steelwork Contractor: Fairfield Mabey

CIVIL 40

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Above: The West and central arch sections are in position to be raised, the East section is already raised and supported by the Fagioli PSC TowerLift system.

Fagioli PSC were employed by Fairfield Mabey to lift and support six sections forming the new Tied Arch Road Bridge in Newport, Wales. The new bridge was part of the road improvement scheme to ease the congestion around Newport.

The following construction sequence was employed:

The two East end sections of the arch (each weighing 225 tonnes) were lifted into place using cranes. The lower ends of the sections were connected to the base tie and the upper ends supported on cradles suspended using Fagioli PSC strand jacks mounted on the Fagioli PSC TowerLift system.

The four major items forming the centre sections of the arch were lifted onto skid rails adjacent to the shore and assembled into two halves. These halves were pulled to the centre of the river using Fagioli PSC strand jacks and connected together prior to lifting. The two West end sections (each weighing 255 tonnes) were then lifted into place in an identical manner to that used for the East end sections.

The complete centre section (weighing almost 800 tonnes) was lifted into place using TowerLift mounted strand jacks and held whilst the permanent connections were made. Finally the strand jacking systems were gradually unloaded allowing the arch to become self supporting.

This project employed the following Fagioli PSC supplied equipment:

- Four square format TowerLift masts (two at 32m high and two at 36m high). These supported the weight of the bridge for a considerable time and were designed to be capable of supporting the load without guy wires even in the event of a storm wind;
- Sixteen 100 tonne capacity Hilman rollers to provide a low friction interface for the movement of the centre section;
- Four L15 strand jacks to provide the motive force for pulling out of the centre sections;
- Eight L100 strand jacks to support the upper ends of the four side sections;
- Eight L100 strand jacks to lift the centre section;
- Hydraulic power packs and control systems as required.