

## Project Profile

# Westminster Bridge Strengthening

Westminster Bridge was opened to traffic on Queen Victoria's birthday, 24 March 1862. The complex seven span structure is a mixture of cast and wrought iron components, each span has 15 longitudinal arch ribs and a "buckle plate" deck. Each rib is made up of a central rivetted wrought iron beam supported by bolted cast iron spandrel sections, a cast iron parapet sat on the cast iron fascia girder. Over many years the bridge has suffered repeated damage from boat impact and undergone modifications and repairs. In 1991 City of Westminster Consultants Rendel, Palmer and Tritton (RPT) carried out an appraisal of the structure; their assessment was that the bridge could only support 7.5t vehicles. Following load testing RPT designed strengthening works to enable the bridge to support 40t traffic loading.

Sandberg Steelwork Inspection Department was seconded to the resident site team to assist in the supervision and inspection of the strengthening works both on and off site and the Metallurgy Department assisted in component assessment.

Principle strengthening works included:-

- the replacement of the existing bridge decking with a reinforced lightweight concrete deck slab cast on the retained buckle plates.
- the provision of shear connection between the ribs and the new deck slab using friction grip bolts.
- the replacement of the cast iron spandrel ends above each pier by steel fabrications pre tensioned to the underside of the pier castings.
- the replacement of rivets by HSFG bolts at wrought iron rib cross girder connections.
- new expansion joints at each pier and abutment.

The fascia girder and parapet were found to be in poor condition and a replica parapet was designed to take load off the fascia girders transferring it to the new deck; this was cast in ductile spheroidal graphite cast iron.

Additional works to repair or replace parts of the bridge became necessary as work progressed i.e. corroded and damaged deck plating and pier protection plates, cracked and damaged cast iron ribs and spandrels.

The protective treatment element of the contract included grit blasting and painting of corroded buckle plate soffits and areas and the full decorative painting of the bridge superstructure, fascia girder, parapet and to the lighting columns which included gold leaf gilding.



**Client:**  
**Duration:**  
**Project Value:**

City of Westminster  
1994 to 1997  
£13.9M

To discuss your needs please contact  
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