The Rebuilding of Wandsworth Bridge

Der Neubau der Wandsworth-Brücke

La reconstruction du pont de Wandsworth

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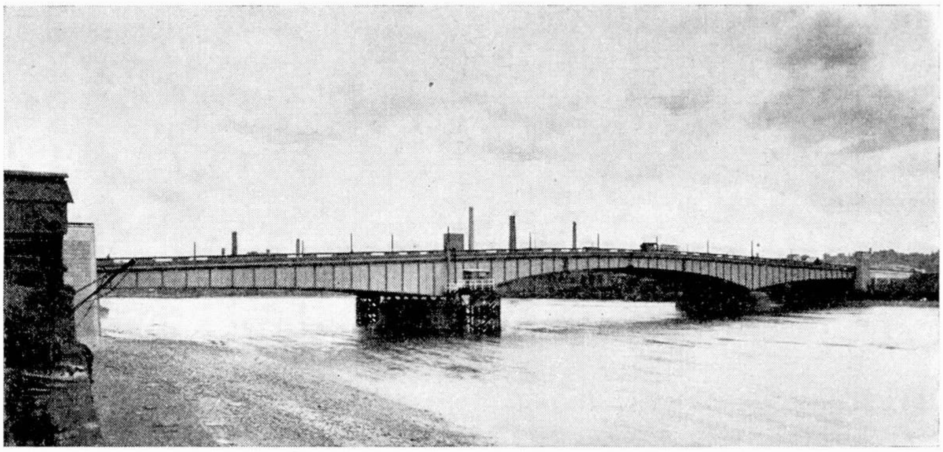
Introduction

Wandsworth Bridge crosses the River Thames and links the Metropolitan Boroughs of Fulham and Wandsworth.

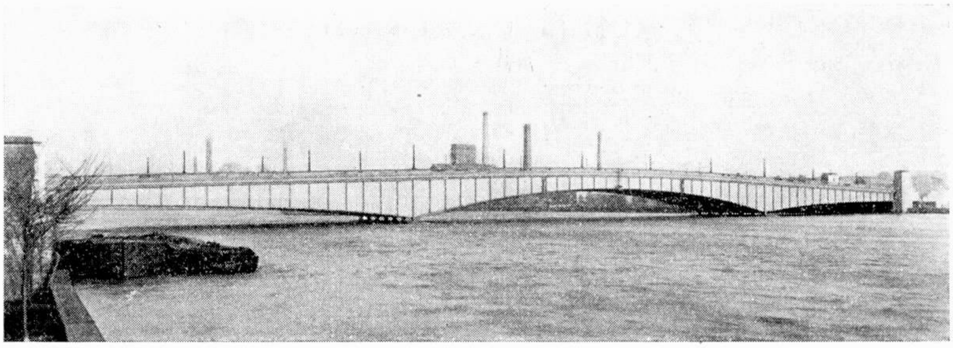
The old bridge, which has been demolished and replaced by the new bridge, was the first to be built on this site. It was opened in 1873, having been constructed by a private company which levied tolls on both vehicular and pedestrian traffic until 1880 when it was acquired with other Thames bridges by the Metropolitan Board of Works and freed from toll. In 1888 the London County Council superseded the Metropolitan Board of Works and became responsible for its maintenance.

The old bridge was of the continuous lattice girder type, the two main girders being each 627 feet long by 12 feet deep, resting on brick abutments and four intermediate supports each comprised of a pair of wrought iron cylinders, filled with concrete, 7 feet 6 inches diameter, with base enlarged to 13 feet 6 inches diameter. There were five spans, the three centre spans being 126 feet each and the shore spans being 106 feet clear. The maximum headway was 19 feet 9 inches at the centre, above Trinity High Water, decreasing to 14 feet 6 inches. The cross girders spaced at 4 feet centres carried a timber deck. The width of the bridge was 30 feet and comprised a carriageway 18 feet wide, paved with wood blocks, and two footways each 6 feet wide, paved with asphalt. A weight limit of 5 tons had been imposed since about 1880.

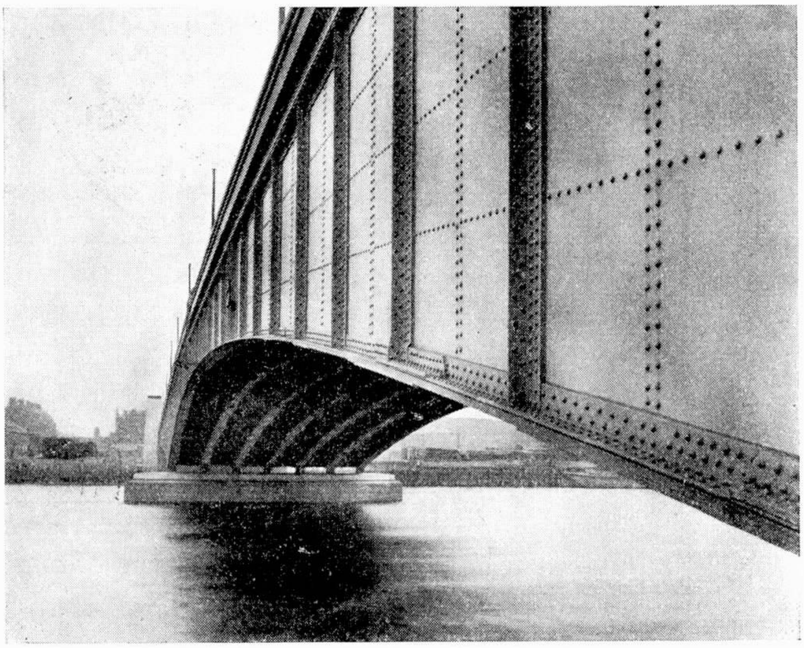
The need for its reconstruction had been repeatedly emphasised by Local authorities and other interested bodies for the following reasons:



Photograph A. Wandsworth Bridge
Upstream elevation from eastern end of Carnwath Laundry Wharf



Photograph B
Wandsworth Bridge. Upstream elevation looking south east



Photograph C. Wandsworth Bridge. Centre span showing upstream parapet girder and north river pier

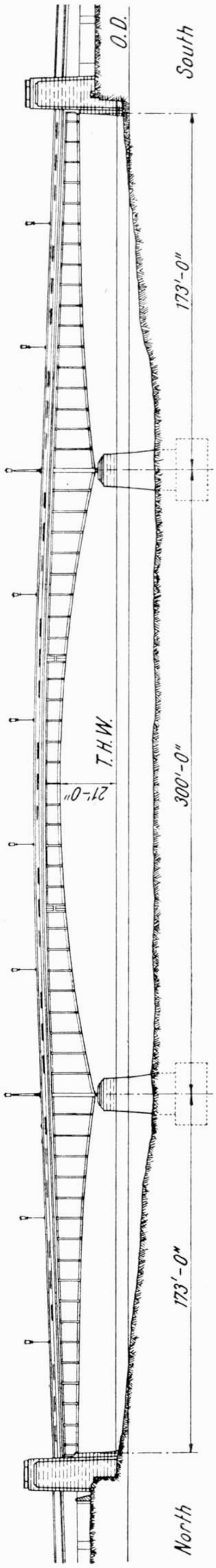
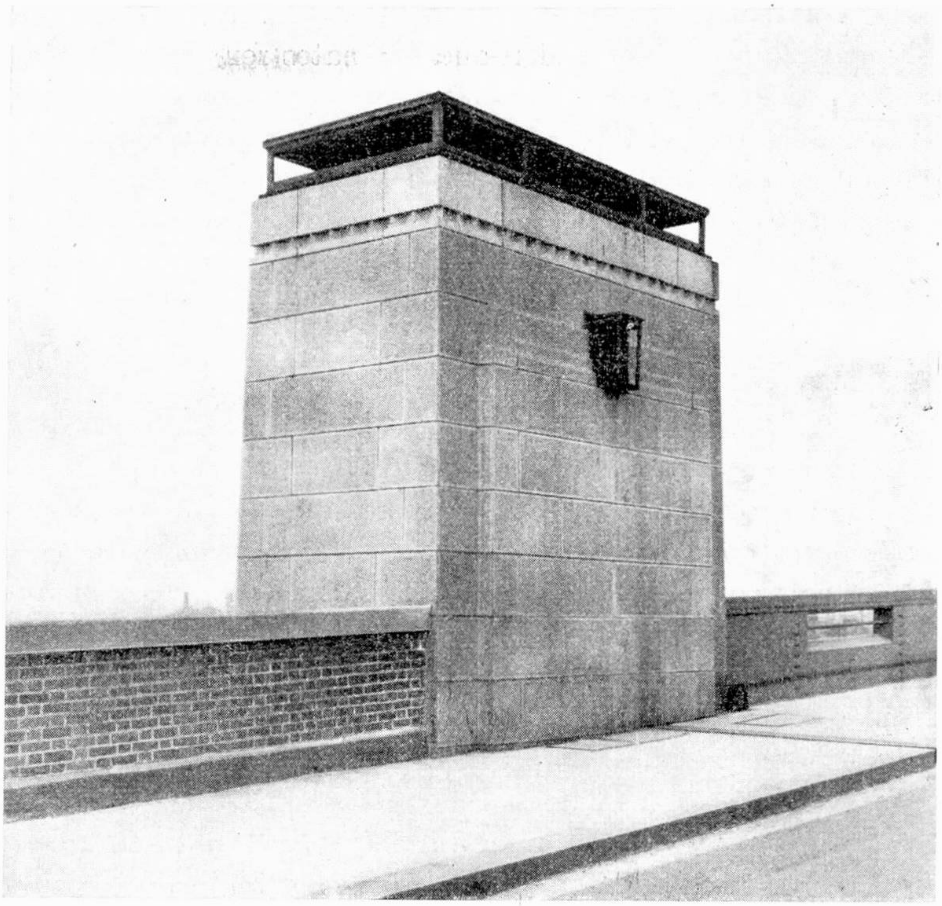


Fig. 1. Elevation



Photograph D. Wandsworth Bridge. South west pylon

a) The lack of an adequate bridge at this point resulted in serious traffic congestion in certain streets in Fulham and Wandsworth.
b) The nearest bridges up and down stream available for heavy modern traffic were Putney and Battersea, which are $2^1/_2$ miles apart.
c) Extensive local industrial developments had taken place on both sides of the river and industrial undertakings found themselves severely handicapped by the lack of adequate cross river facilities.
d) Pedestrians had to walk across the bridge because it was too weak to carry omnibuses.

In 1926 the Royal Commission on Cross River Traffic in London stated that they considered "the improvement of the bridge as an important and urgent matter" and recommended "that the bridge should be rebuilt as a four line bridge to take all classes of traffic in conjunction with the improvement of the Southern approach".

In 1929 the London County Council decided that the widening of Putney Bridge should be given priority and subsequently the condition of Chelsea Bridge was found to be such that the Council and the Ministry of Transport agreed that the reconstruction of Chelsea Bridge should be given priority over Wandsworth and it was not therefore until December 1935 that the Council approved the design and estimates for the reconstruction of Wandsworth Bridge and the widening of the approaches.

Tenders received in response to public advertisement were opened on 14th July 1936, and the lowest tender submitted by Messrs. Holloway Brothers (London) Ltd., was accepted. The order to commence was dated 8th October 1936, and the period specified for completion was 3 years but the bridge for reasons given herein was not opened to traffic until 20th September 1940.

Short description of new bridge

The new bridge is illustrated in Figs. 1 to 4 and on photographs A – D. It is a steel bridge of the deck cantilever type, 646 ft. long between faces of abutments, and comprising three main spans. It is 60 ft. wide with a carriageway 40 ft. wide and two footways each 10 ft. in width. The two shore openings formed by the anchor arms of the cantilevers have each a clear span of 164′6″ at Trinity High Water level, the span from centre of abutment bearing to centre of pier being 178′6″. The centre opening has a clear span of 284 ft. at Trinity High Water level and comprises a suspended span of 120 ft. and two cantilever arms of 90 ft. each, making the total span 300 ft. centre to centre of piers. There are 7 longitudinal main girders, spaced at 10 ft. cross centres, the five girders under the carriageway of the anchor and cantilever arms are of lattice construction but the two outer girders and all the suspended span girders are plated. All main members of the lattice girders are of high tensile steel which has also been used for the plate girders, except at the shore ends of the anchor arms, where it was more economical to use mild steel. The headway at the centre is 21 ft. above T.H.W. The abutments and piers are of mass concrete faced with granite and are founded on the London blue clay. The new approach viaduct at the south end of the bridge comprises 5 reinforced concrete slab spans on mass concrete piers and at the north end there is a single approach span. The immediate approaches of the bridge between Townmead Road, Fulham, and York Road, Wandsworth, have been regraded and widened to 60 ft.

Loads and Stresses

The bridge was designed to carry the Ministry of Transport's Standard Loading for Highway Bridges.

For the main girders only 90% of the standard loading was assumed to come on to any one main girder. This reduction in loading made allowance for the improbability of all four lanes of traffic being loaded to a maximum at the same time and if one or two lanes were fully loaded the cross bracings and floor members would distribute the loading over all the main girders.

The floor members and the short approach spans were designed for an alternative loading of a 100-ton boiler wagon having two axles, spaced 25 feet apart, each axle load assumed uniformly distributed over a width of 10 feet at steel level.

The latter loading has been adopted in London as a standard on certain through routes to enable exceptionally heavy loads to pass through London.

The effect of wind on a structure of this type is negligible.

The basic tensile working stress for high tensile steel, which had a yield point of 23 tons per square inch and a tensile breaking strength of 37 – 43 tons per square inch was 12 tons per square inch.

Temporary Bridge

Before the old bridge could be closed to traffic and demolished it was necessary to construct a temporary bridge for the accommodation of pedestrians and electric cables.

This bridge was constructed on the downstream side of the old bridge and the contractors were able to utilise the steel temporary bridge which they had recently used at Chelsea Bridge with minor alterations. It had a clear width of 10 ft. between main girders for pedestrians and carried a cantilevered contractors gangway 5 ft. wide on the upstream side. The electric cables were laid under the timber decking. There were five spans varying from 120 ft. to 180 ft. carried on clusters of timber piles with protective timbering, the clear headway above Trinity High Water was 21 ft. The northern and southern shore spans and the second span from the north end were erected on trestles and piled supports and the remainder of the steel superstructure was erected by cantilevering out. The old bridge was closed to vehicular traffic on 24th May 1937, but remained open to pedestrians whilst the electric cables of the Central Electricity Board and the London Passenger Transport Board were being diverted from the old bridge to the temporary bridge. This work was completed by 11th June, when the temporary bridge was opened to pedestrians and the old bridge completely closed to traffic.

Demolition of old bridge

After the paving and timber decking had been stripped from span 4 from South end, the main girders were burnt through so as to enable central lengths of 20 ft. to be removed from each girder. These lengths were lifted out by two 7-ton derricks on the north pier staging, the remaining portions of the two girders being self-supporting as they were then acting as cantilevers. Pieces of the main girders were then cut off in convenient lengths of about 12 ft. by means of oxy-acetylene cutters and lowered into barges, the material on the north side being removed by 7-ton derricks and the southern portion was removed by a 5-ton hand derrick erected on the decking of the bridge. The main girders of the other river spans (3 and 2) were demolished in a similar manner by cantilevering southwards, the materials being handled by means of the 5-ton derrick. The girders were freed at the third pair of cylinders from the South end by jacking up and removing bearings and concrete from the tops of the cylinders. When the jacks were lowered the girders were again in the cantilevered condition and demolition continued. A similar procedure was adopted at the second pair of cylinders from the South end. The main girders of the shore spans were lowered to the river bed and cut up there into suitable lengths for removal. Timber piled staging was erected around the piers of the old bridge, the bearings, caps and bracings removed, and the cylinders were first demolished to a level of + 17,50 Ordnance Datum. The concrete inside each cylinder was then broken out down to − 22,50 Ordnance Datum and each cylinder cut around its perimeter at this level. Each cylinder was extracted from the river bed by means of two 50-ton hydraulic jacks placed beneath a 20 in · $6^1/_2$ in. B.S. Beams crosshead, and thrusting by means of two 14 in. · 14 in. timbers against the concrete in the base of the cylinder which remained in the river bed. When the jack had started the cylinder and lifted it 1 ft. 6 in. the movement was continued by two hand winches and the cylinder was finally removed by the 7-ton crane on the staging. The load on the jacks required to move a cylinder of the river piers was about fifty tons and to move a cylinder of the shore piers about ninety tons was required. This was equivalent to a skin friction of 3,5 cwts. per square foot for the river piers and 4,3 cwts. per square foot for the shore piers.

To remove a cylinder which had been damaged in 1912 by the S.S. "Wandle" and had been repaired by constructing an enlarged base around it out of cast iron rings 22′6″ diameter, special measures were necessary. A small steel sheet pile cofferdam was driven around this cylinder and the cylinder demolished within the cofferdam down to − 22,5 Ordnance Datum.

The holes at the sites of the first pair of cylinders from the South end were filled with material grabbed from the foreshore but the holes at the other cylinder sites were allowed to silt up.

New Bridge

Tenders

The tender documents provided for the submission of alternative tenders on the following bases:

1. If the river piers were built up on caissons sunk under compressed air; and
2. if the river piers were constructed inside open cofferdams.

Tenders ranged from £ 322 000 – 386 000 under basis 1 and from £ 310 000 to £ 376 000 under basis 2.

In all the tenders the second alternative was lower than the first, the difference varying from £ 7 000 to £ 18 000, the average difference for tenders being £ 12 500 (approximate figure). The lowest tender showed a saving of over £ 12 000 in favour of the second alternative and therefore this method was adopted.

The actual cost was appreciably lower than the lowest tender as certain provisional sums in the tender were not expended.

Cofferdams and Piers

The excavation in the cofferdams showed that there was about 2 ft. of mud on the river bed overlying a thin bed of ballast about 2 ft. 6 in. thick and then unbottomed London blue clay. These results differed somewhat from the trial borings.

In order to provide for possible future dredging of the navigation channel the Port Authority stipulated that the pier foundations should not project above the level of −22,50 Ordnance Datum and to allow a suitable depth for the foundations the piers were founded at −37,50 Ordnance Datum in good London blue clay. The size of the rectangular pier bases shown on the contract drawings was 92 ft. 9 in. by 30 ft. 6 in. but this was modified slightly during construction in order to suit the steel sheet piling, the size as constructed being 93 ft. 3 in. by 30 ft. inside the faces of the piling. The foundation pressure on the clay with dead load only is 3,75 tons per square foot and the maximum pressure with Ministry of Transport standard loading is 4 tons per square foot.

Temporary timber staging was constructed around the site of each pier on 12″ by 12″ piles at about 10 ft. centres suitably braced and with 12″ by 6″ vertical fenders fixed round the outer faces at 3′6″ centres. The noses and corners of the stagings were stiffened by well braced dolphins of 12″ by 12″ and 14″ by 14″ pitch pine piles. Floating booms were provided.

The cofferdams were constructed with Dorman Long & Co's Krupp K. 111 steel sheet piling weighing 32,56 lbs. per square foot driven to −45,50 Ordnance Datum, that is to say, 8 ft. below foundation level, and carried up to the Thames Flood level (+19,00 Ordnance Datum). The piles were driven in pairs, welded together, by means of a No. 7 and a No. 9B2 McKiernan Terry hammer.

The specification provided that the lowest frame in each cofferdam should be constructed in reinforced concrete well rammed against the steel sheet piling and so formed and drained as to prevent any water which might leak through the sheet piling from reaching the bottom of the excavation. This method had been adopted by Messrs. Holloway Brothers in the cofferdams for the new Chelsea Bridge and had enabled the bottom of the excavation to be kept dry whilst the concrete of the pier foundation was being deposited.

The reinforced concrete frame was built into the concrete foundation and thus formed part of the permanent work.

The three upper frames of the cofferdam were constructed of built up steel sections to the designs of the contractors. The reinforced concrete frame was the 4 th frame, the bottom of the frame being at −25,00 Ordnance Datum and the contractors intended this to be the bottom frame. They contended that it was not necessary to put in another frame between the concrete frame and the bottom of the excavation as the steel sheet piling would be sufficiently strong to support the pressure of the clay during the comparatively short period that would be required to deposit the concrete foundations. This contention was not acceptable to the Engineer, who insisted on the insertion of a 5 th frame. The north pier cofferdam was constructed well in advance of the south pier cofferdam and therefore it was decided to use the steel frame, which had been fabricated ready for use as the third frame of the south pier cofferdam, as the fifth frame of the north pier cofferdam. This frame was removed as the concrete foundation was brought up and it was then available for use in the south pier cofferdam. Similarly, the third frame of the north pier cofferdam was used as the fifth frame of the south pier cofferdam. The small quantity of water which leaked through the sheet piling was caught at the reinforced concrete frame and led to a sump and was easily dealt with by a 20 h.p. pump. The bottom of the excavation was thus kept perfectly dry whilst the concrete foundation was being deposited. The rectangular base of the pier, 93 ft. 3 in. by 30 ft. wide by 14 ft. 6 in. thick, is built of 8 to 1 concrete. Above the base the pier shaft is constructed wholly of 6:1 concrete up to the level of −6,66 Ordnance Datum, which is about low water level, and above this level it is faced with granite. The granite facing stones of the cut-waters were dowelled together by slate dowels 4 in. square · 8 in. long. The height of the granite courses is 1 ft. 9 in. After each course of granite was set and grouted the concrete hearting of the pier was laid to the level of the top of the course. The steel struts of the cofferdam frames were removed as the pier was built up and replaced by short timber struts between the pier and the walings.

The cofferdam piles were cut off a few inches above the concrete base at the level of −22,50 Ordnance Datum and the lower portions left in.

Abutments

The abutments were built of mass concrete faced with granite above the level of +0,91 Ordnance Datum, and founded on London blue clay.

They were constructed inside steel sheet pile cofferdams, driven to a depth of about 10 feet below the foundations on the river side and carried up to flood level +19,00 Ordnance Datum. The cofferdams completely enclosed the abutments and were constructed with Dorman Long & Co's Krupp

K 111 sheet piling. It was necessary to cut chases through the existing river walls in order that the upstream and downstream ends of the cofferdams could be driven through them. The north abutment of the old bridge was sited wholly within the cofferdam for the new north abutment and was demolished as the excavation proceeded, but the south abutment of the old bridge was sited partly within and partly outside the cofferdam and therefore a chase had to be cut through the old abutment to allow the sheet piling to pass through. The cofferdams were strutted by means of frames with cross struts, spaced about 15 feet apart which were erected as the excavation proceeded, the two top frames being fabricated in steel and the bottom frame in reinforced concrete afterwards built into the concrete foundations. No difficulty was experienced in driving the sheet piling, but during the progress of the excavation for the north abutment it was discovered that one of the clutches had fouled a wire bond buried in the foreshore and had been burst open on the riverside face of the dam, leaving a triangular area of clay exposed about 16 feet high by about 1 ft. 6 in. maximum width. This was protected by driving a few piles outside the dam.

The abutments were founded on London blue clay and a good dry bottom was obtained by catching any seepage through the sheet piling at the reinforced concrete frame.

When the abutments had been built to above flood level, the cofferdam piles at the south abutment were cut off at the level of −6,50 Ordnance Datum, and at −9,50 at the north abutment, the bottom portions being left in.

Superstructure

The deck of the bridge is carried on 7 longitudinal main girders spaced at 10 feet centres. The five inner girders of the anchor and cantilever arms are N. type lattice girders but all the girders of the suspended span and the outer girders of the anchor and cantilever arms have solid web plates. The steel troughing which forms the deck of the bridge is $^1/_2''$ thick under the carriageway and $^3/_8''$ thick under the footways. It is carried on cross girders spaced at 10 ft. centres spanning between the top booms of the main girders. There is cross bracing between the main girders at each cross girder and lateral bracing is provided in the plane of the bottom flanges of the main girders. Typical details are shown in figures 2 and 4.

A cornice built up of steel plates and sections and filled with 6 to 1 concrete runs the length of the bridge and rests on the top of the outer girders.

The main girders are carried on fixed bearings at the piers and on expansion bearings at the abutments. The suspended span rests on fixed pin bearings at the south end and on expansion bearings at the north end. Details of the bearings are shown in figure 3.

The cast steel bearings are fixed to the piers by anchor bolts and channels.

Fig. 2
Half Longitudinal Section

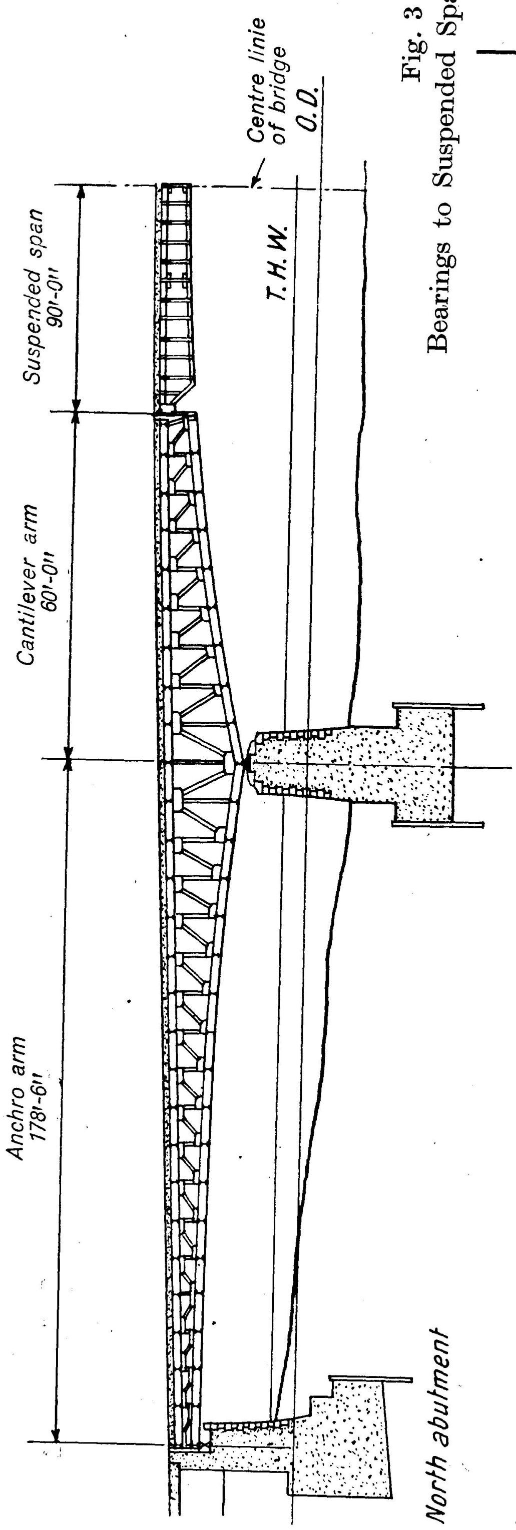
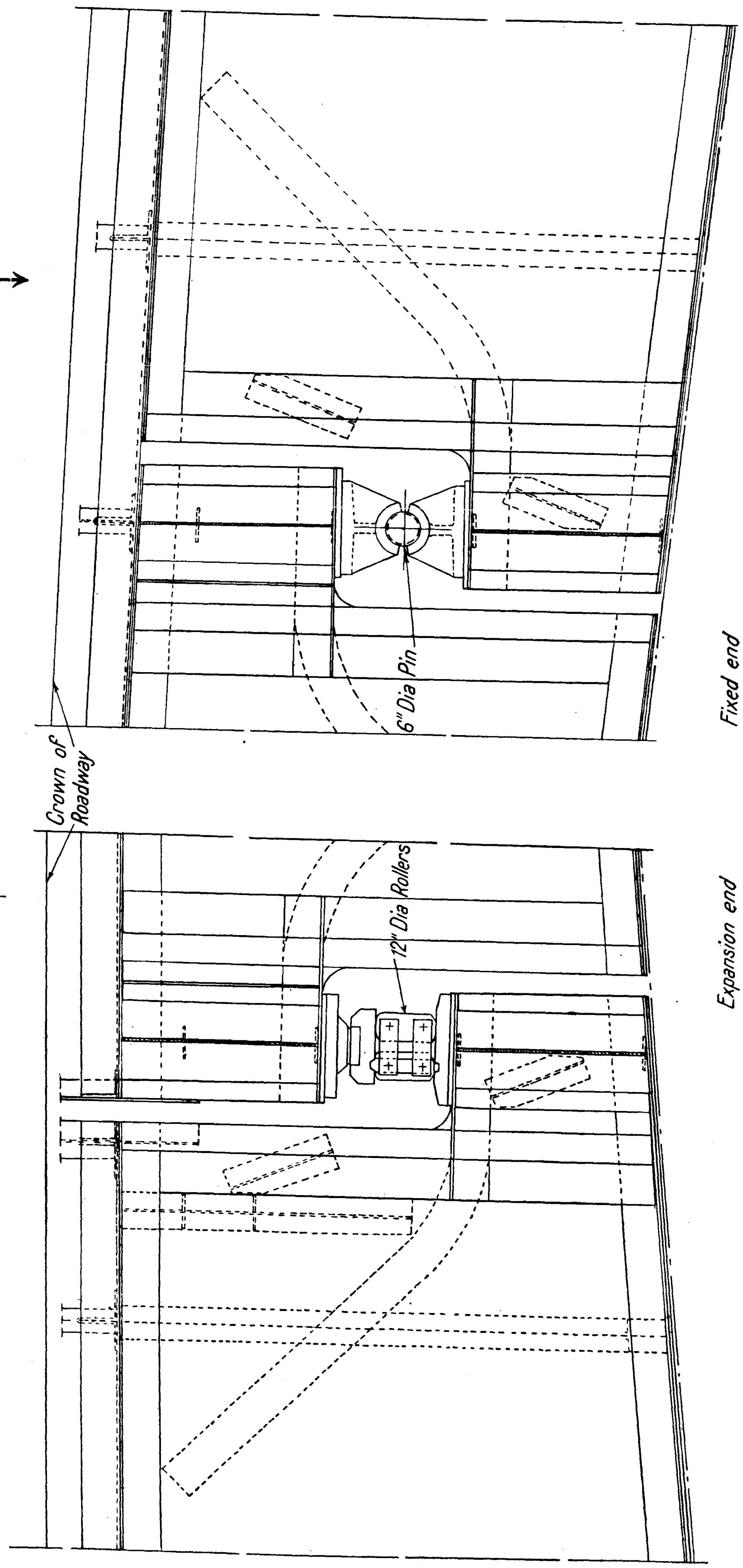


Fig. 3
Bearings to Suspended Span Parapet Girders



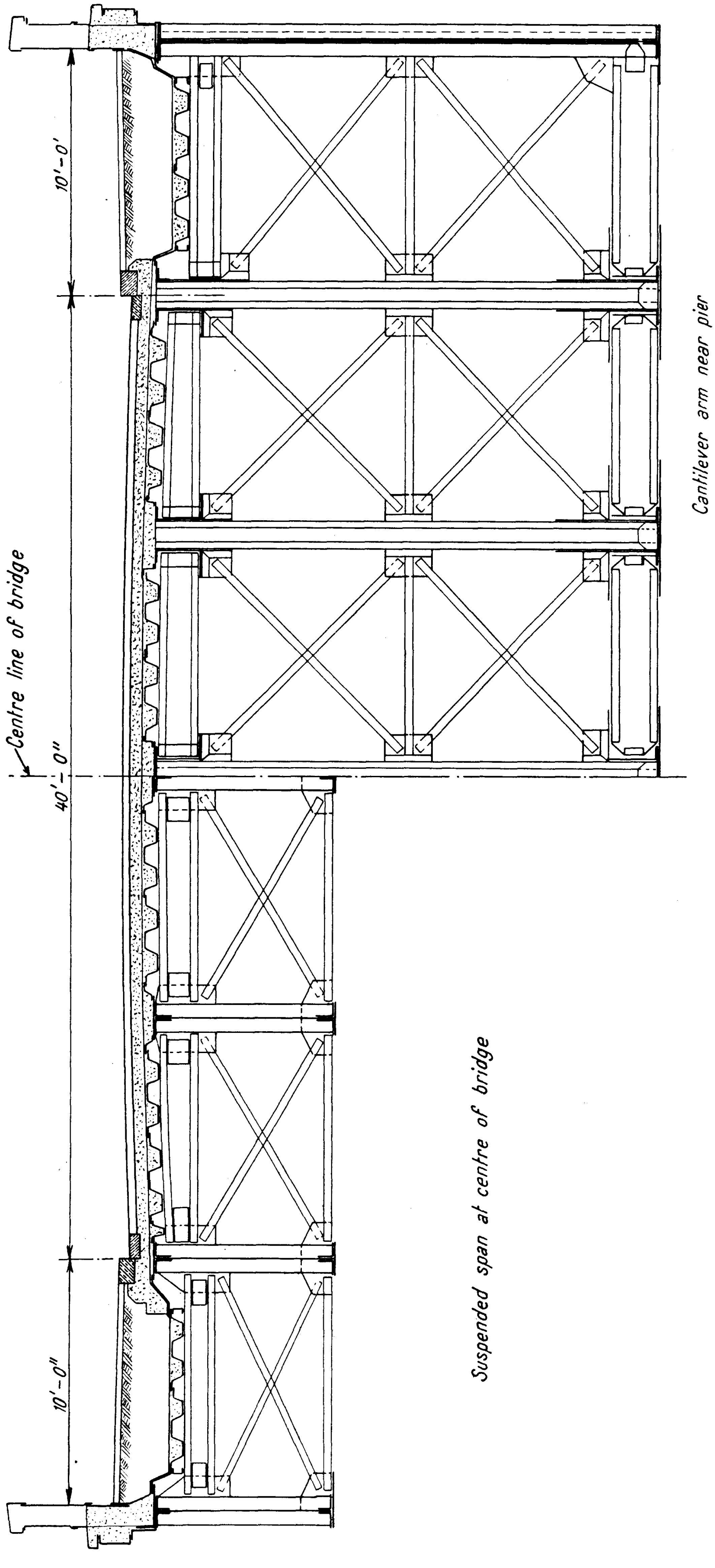


Fig. 4. Half Cross Sections

In order to provide for a possible upward reaction at the abutments the expansion bearings are also held down by bolts and channels, Under normal loading there is no upward reaction but a small upward reaction is possible under certain improbable conditions of loading.

High tensile steel was used for the cross girders under the carriageway and for the following parts of the main girders: the chords, web members, main gussets, joint covers and lacing flats of the inner girders of the anchor and cantilever arms; the flanges, webs and joint covers of the outer girders from panel point 9 to end of cantilever; and the flanges, webs and joint covers of all seven main girders of the suspended span.

With slight modifications the high tensile structural and rivet steel were required to comply with British Standards Specification No. 548 – 1934. All web plates, web joints, covers and gusset plates of high tensile steel were normalised after rolling.

Erection of Superstructure

The erection of the superstructure was commenced on 17th November, 1938, at the North Pier; on 29th November, 1938, at the South Pier. The five roadway girders were erected first, the sections being placed in position by the derrick cranes on the pier stagings. The girders were built out in both directions, with a preponderance of weight on the anchor arms, which were supported by piles in the river bed. Except for the pier stagings there were no supports under the main span. The cross girders and bracings followed closely behind the erection of the main girders, and at a later date the troughing was placed in position. When the erection had reached the limit of the derrick cranes on the stagings, two of them were transferred to the deck where they were used for the erection of the remaining sections of the anchor and cantilever arms.

The erection of the north anchor and cantilever arms was completed on 20th July 1939, and on the south side on 13th July 1939.

The suspended span roadway girders were erected in one piece, the first two were taken into the river by barge on 16th July 1939, and lifted into position by the derricks on the bridge deck. This operation only necessitated the closing of the river to traffic for 38 minutes. These girders were braced together and formed a platform from which the remaining 3 roadway girders were lowered on to their bearings. The last of the suspended span roadway girders was placed in position on 16th August 1939.

A somewhat similar method was adopted for the plated parapet girders, the steel troughing, which had been erected providing a convenient working platform. The last two suspended span girders were erected on 10th January 1940.

The time taken for the erection of the steelwork would not be regarded as satisfactory in normal times and there is no doubt that the erection could have been completed much earlier if the re-armament programme had not seriously interfered with the fabrication of the steelwork.

The erection of all the steelwork was not completed until March 1940 by which time a large part of the roadway had been completed.

Approaches

The approach works included in this contract were the widening of Bridgend Road to its junction with York Road and Wandsworth Bridge Road to its junction with Townmead Road.

The Southern Approach, immediately adjacent to the main bridge is supported on 5 reinforced concrete slab spans with mass concrete piers, the first with a clear opening of 30 ft. and the remainder 25 ft. It was necessary to introduce a reinforced concrete girder each side of both the footways in order to provide accommodation for public utility services and the outer girders vary in depth so as to provide a horizontal soffit line. Southward of these spans the road is supported by a mass concrete retaining wall along its east side. On the west side the existing retaining wall was not disturbed.

The Northern Approach is supported by one reinforced concrete slab span, adjacent to the main bridge and the remainder of the raised approach is on embankment which is contained within two mass concrete walls for a distance of 64 ft. The maximum gradient on the approaches is 1 in 28.

The carriageway of the approaches consists of a 9″ reinforced concrete slab surfaced with 3″ asphalt in Bridgend Road and $3^1/_2$″ asphalt in Wandsworth Bridge Road in accordance with the wishes of the respective borough councils, and the footways are paved with $2^1/_2$″ artificial stone slabs.

Architectural Treatment

Except for the granite pylons at each end of the bridge there are no special architectural features and the appearance of the bridge depends more on its outline than on ornamentation.

No attempt has been made to disguise the fact that there is a suspended span, as the bearings are clearly visible. Purists may criticise the curved soffit of the suspended span, but in addition to the improved appearance it was more economical to curve the soffit than to lift the whole bridge in order to provide the requisite headway for river traffic.

Careful attention was given to various details in order to enhance the appearance. Every alternate stiffener of the outside girder was placed on the inside of the web only and those on the outside were increased in size to give a panelled effect to the bridge. The solid steel parapet is unusual in bridges of this type. The bottom flanges of the outer girders were made the same width as the bottom chord of the roadway girders. The granite facing to the piers, abutments and the outer face of the pylons was specified to be "rock face finished with projections punched off to a maximum of 1 inch from pitched line". This rough finish to the granite has a pleasing effect.

The design was submitted to the Royal Fine Arts Commission who very readily endorsed the scheme and had no criticisms to offer.

The appearance of the new bridge has received favourable comment and it undoubtedly is a great improvement on the previous structure.

Costs and Steel Weights

The cost of the completed works was approximately £ 262 000 and the cost of the bridge, excluding the cost of the approaches, the temporary bridge and the demolition of the old bridge, was about £ 215 000 which works out at £ 5,5 per sq. ft. based on the area available for traffic between the faces of the abutments.

The summary which follows gives the cost of the main items of the work:

	£
Temporary Bridge	15 262
Demolition of old bridge	8 954
River piers, including cofferdams	47 134
Abutments, including cofferdams	40 576
Superstructure	114 589
Steam tug for assisting navigators	11 429
Dredging navigation channel	1 523
Approach works	22 298
Total	261 765

The weights of the different kinds of steel used are given below:

	tons
High tensile steel	1 778
Mild steel	1 288
Cast steel	71
Forged steel	14
Manganese steel	4
Total	3 155

Acknowledgments

The new bridge was designed and its construction supervised by the Bridges and General Works Division of the Chief Engineer's Department of the London County Council under the direction of Sir Peirson Frank, M.I.C.E., F.S.I. at that time the Chief Engineer. The authors wish to express their thanks to their colleagues for their collaboration on this bridge and in particular to Mr. E. Granter, B.Sc., M.I.C.E., M.I. Struct. E., for his work on the design and to Mr. J.A.K. Hamilton, G.M., B.Sc., M.I.C.E., who was Resident Engineer.

The designs were made in collaboration as regards architectural treatment with Mr. E. P. Wheeler, F.R.I.B.A., who was for part of the time the Council's Architect, his successor Mr. F. R. Hiorns, F.S.A., F.R.I.B.A., and Mr. Edwin Williams, M.B.E., M.A., B.Arch., F.R.I.B.A., Assistent Architect.

The contractors were Messrs. Holloway Bros. (London) Ltd. and the work was carried out under the direction of Mr. W. Storey Wilson, M.C., B.Sc., M.I.C.E., and the Agent, Mr. G.I.B. Gowring, B.Sc. (Eng.). The excellent manner in which the bridge was constructed reflects credit on the contractors' organisation.

Summary

The Old Wandsworth bridge, built in 1873, was of the continuous lattice girder type, with two main girders 627 feet long by 12 feet deep. The bridge had a carriageway of 18 feet and two footpaths each 6 feet wide. A weight limit of 5 tons was imposed about 1880. This weight restriction caused considerable inconvenience and consequently the London County Council, in 1935, approved a design and estimates for a new bridge.

The new bridge is a steel bridge of the deck cantilever type 646 feet between abutments. It is 60 feet wide with a carriageway of 40 feet and two footways each 10 feet wide. The centre opening has a clear span of 284 feet. There are 7 longitudinal girders spaced at 10 foot centres, the five girders under the carriageway are of lattice construction but the two outer girders are plated. High tensile steel was used for most of the main members.

The new bridge was designed to carry the Ministry of Transport's standard loading with an alternative of a 100 ton boiler wagon.

The contract included the provision of a temporary foot bridge, which was also used to carry electric cables.

The methods adopted in demolishing the old bridge and constructing the new are described in the paper and include details of the cofferdams, foundations, abutments and superstructure.

A summary of steel weights and costs of the bridge is also included.

Zusammenfassung

Die alte Wandsworthbrücke vom Jahre 1873 besaß zwei durchlaufende Gitterträger als Hauptträger von 627 Fuß Länge und 12 Fuß Höhe. Die Brücke hatte eine Fahrbahn von 18 Fuß Breite und zwei Gehwege von je 6 Fuß Breite. Im Jahre 1880 mußte die Verkehrslast auf 5 Tonnen beschränkt werden.

Da diese Einschränkung viele Unannehmlichkeiten verursachte, stimmte der Londoner Stadtrat im Jahre 1935 den Plänen und dem Kostenvoranschlag für eine neue Brücke zu.

Das neue Bauwerk ist eine Auslegerbrücke von 646 Fuß totaler Länge. Sie ist 60 Fuß breit: eine Fahrbahn von 40 Fuß Breite und zwei Gehwege von je 10 Fuß Breite. Die Mittelöffnung besitzt eine Spannweite von 284 Fuß. Es wurden 7 Hauptträger angeordnet in 10 Fuß Abstand. Die 5 Träger unter der Fahrbahn sind Fachwerke, die zwei Randträger sind vollwandig. Für die meisten Haupttragglieder wurde hochwertiger Stahl verwendet.

Die neue Brücke wurde berechnet für den Standard-Belastungszug des Transportministeriums oder für einen 100 Tonnen schweren Tankwagen, wenn dies ungünstigere Werte ergab.

Im Bauvertrag war die Erstellung einer temporären Fußgängerbrücke inbegriffen, die auch zur Überführung von elektrischen Kabeln diente.

Die beim Abbruch der alten und beim Bau der neuen Brücke angewandten Baumethoden, ferner Details der Fangdämme, der Fundationen, der Widerlager und des Aufbaus werden im Beitrag eingehend beschrieben.

Eine Zusammenstellung des Stahlverbrauches und der Baukosten ist beigefügt.

Résumé

L'ancien pont de Wandsworth, qui datait de 1873, comportait comme poutres principales deux poutres continues en treillis ayant une longueur de 190 m et une hauteur de 3,60 m environ. Le tablier avait une largeur de 5,50 m et il existait deux trottoirs ayant chacun une largeur de 1,80 m environ. La charge roulante a dû être limitée à 5 tonnes en 1880. Cette limitation impliquait de nombreux inconvénients; c'est pourquoi le Conseil Municipal de Londres approuva, en 1935, un projet de construction d'un nouveau pont.

Il s'agit d'un pont en cantilever ayant une longueur totale de 197,50 m environ. La largeur de l'ouvrage est de 18,30 m et se répartit comme suit: un tablier de 12,20 m et deux trottoirs ayant chacun une largeur de 3,05 m. La travée centrale a une portée de 86,59 m. Il a été prévu 7 poutres principales espacées entre elles de 3,05 m. Les 5 poutres principales qui se trouvent au-dessous de la chaussée sont des poutres en treillis; les deux poutres latérales sont à âme pleine. La plupart des éléments porteurs principaux sont en acier à haute résistance.

Le nouveau pont a été calculé pour le train de charge normale du Ministère des Transports ou pour un camion-citerne de 100 tonnes lorsque ce dernier type de charge donnait des valeurs plus défavorables.

Le contrat prévoyait la construction d'une passerelle provisoire devant servir également au passage des câbles électriques.

L'auteur expose d'une manière détaillée les méthodes adoptées tant pour la démolition de l'ancien pont que pour la construction du nouvel ouvrage; il donne également des indications de détail sur le système de batardeaux employé, les fondations, les appuis et les procédés de montage, ainsi que sur la consommation d'acier et les prix des différents éléments de l'ouvrage.