

New Lifting Bridge at Kings Ferry

THE new lifting bridge at Kings Ferry, which carries rail and road traffic between the mainland of Kent and the Isle of Sheppey, was opened officially by the Duchess of Kent on April 20. Rail traffic had begun to use the bridge ten days earlier. The total cost of the scheme amounted to £1,380,810, of which £122,500 was subscribed by the British Transport Commission.

The vertical lifting span is raised on four reinforced concrete piers which are some 130 ft. high. This gives clearance for shipping of 95 ft. between high water and the underneath side of the roadway when raised. A clear fairway of 95 ft. width also is provided. The 650 ft.-long bridge is carried on two main piers flanked by approach piers on each side, with shore abutments. It has an overall width of more than 50 ft. which includes a single rail track, a 24 ft.-wide roadway and a 6-ft. pathway.

The concrete towers house the counterweights, sheaves, and bridge control room. The two machine rooms, one each side of the river, are housed below road level. The lifting span, which rises vertically between the towers, weighs 465 tons and is counterweighted by four 110-ton weights. The bridge is raised by electric motors which are specified to raise it to its full height in $1\frac{1}{2}$ min. In the event of a breakdown in the electricity

supply, standby diesel alternators are capable of raising the bridge to its full height in about 15 min. There is a synchronous tie between the motors in each machine room to ensure that the span remains level during raising and lowering. The machinery chambers at each main pier rest on two concrete cylinders which are founded in the London clay approximately 60 ft. below high water level. These cylinders are hollow, of 32 ft. external diameter with reinforced concrete walls 5 ft. 6 in. thick.

Cables and gas and water services are taken down the hollow cylinders and through a tunnel driven below the river bed between the piers. The tunnel is of 8 ft. 6 in. internal diameter and 127 ft. long measured between the centres of the piers, and about 15 ft. below the level of the river bed. The shafts and tunnel are equipped with electric lighting and access is by staircase from bridge level.

On each side of the lifting span there are three side spans of approximately 80 ft. each. The approach piers are each founded on five reinforced concrete piles 4 ft. in diameter resting on London clay about 80 ft. below high water level. The road and rail approach embankments and main abutments are founded on difficult ground. The whole area is marshland and the first 25 ft. depth below the surface is very soft clay overlying stiff London clay. The top clay is so soft that the

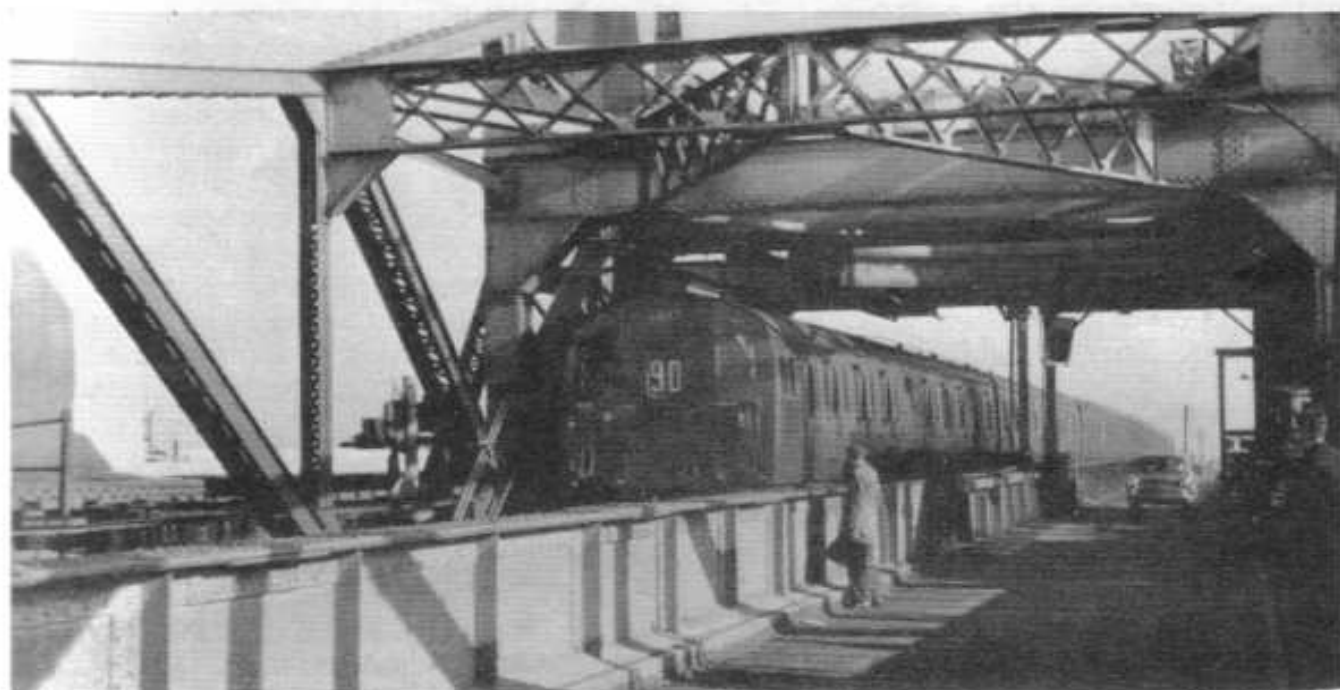


Lifting span of the new bridge in the raised position, showing the rail approach and a train crossing the old bridge

maximum height of embankment which could be built without special measures was approximately 14 ft. above the existing ground level. Special measures were taken to accelerate the settlement in the embankments adjacent to the solid bridge structure. Because of the ground conditions the main abutments of the bridge are hollow boxes resting throughout on concrete piles approximately 18 in. in

diameter and between 50 ft. and 60 ft. in length.

The Sittingbourne-Sheerness branch of the Southern Region of British Railways, which was electrified on June 15, 1959, has been realigned to cross the new bridge, but there is no third rail on the lifting span. Trains are of sufficient length to span the lifting section, and so maintain third rail continuity.



Photo]

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Electric train from Sheerness on the lifting span of the old bridge