



Siemens-Schuckertwerke
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PROGRESS ON THE SHANNON

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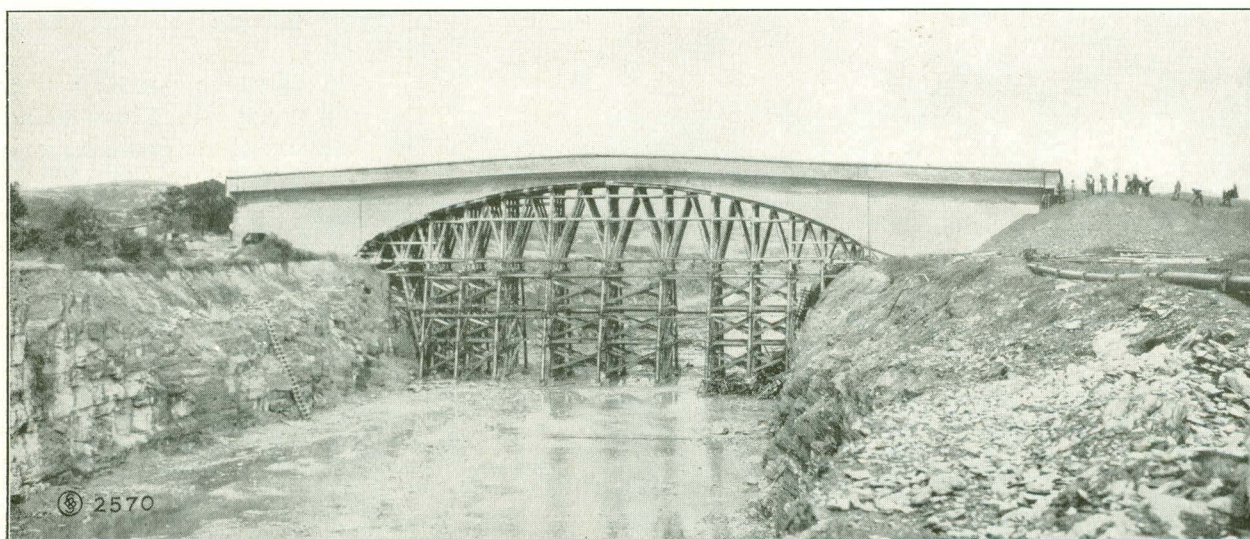
Clonlara Rockcut and Bridge.

Near the village of Clonlara the Head Race cuts through a rock hill for a distance of about 700m. Working to the specified cross section of the Head Race in rock cutting a total of 180 000 cbm. of rock — blue grey limestone — had to be excavated. The bottom of the canal is at level -24.50, the width at the bottom is 31.50 m., and the slopes are at 6:1. The work began in July 1926 with a 2 cbm. capacity caterpillar steam shovel excavator.

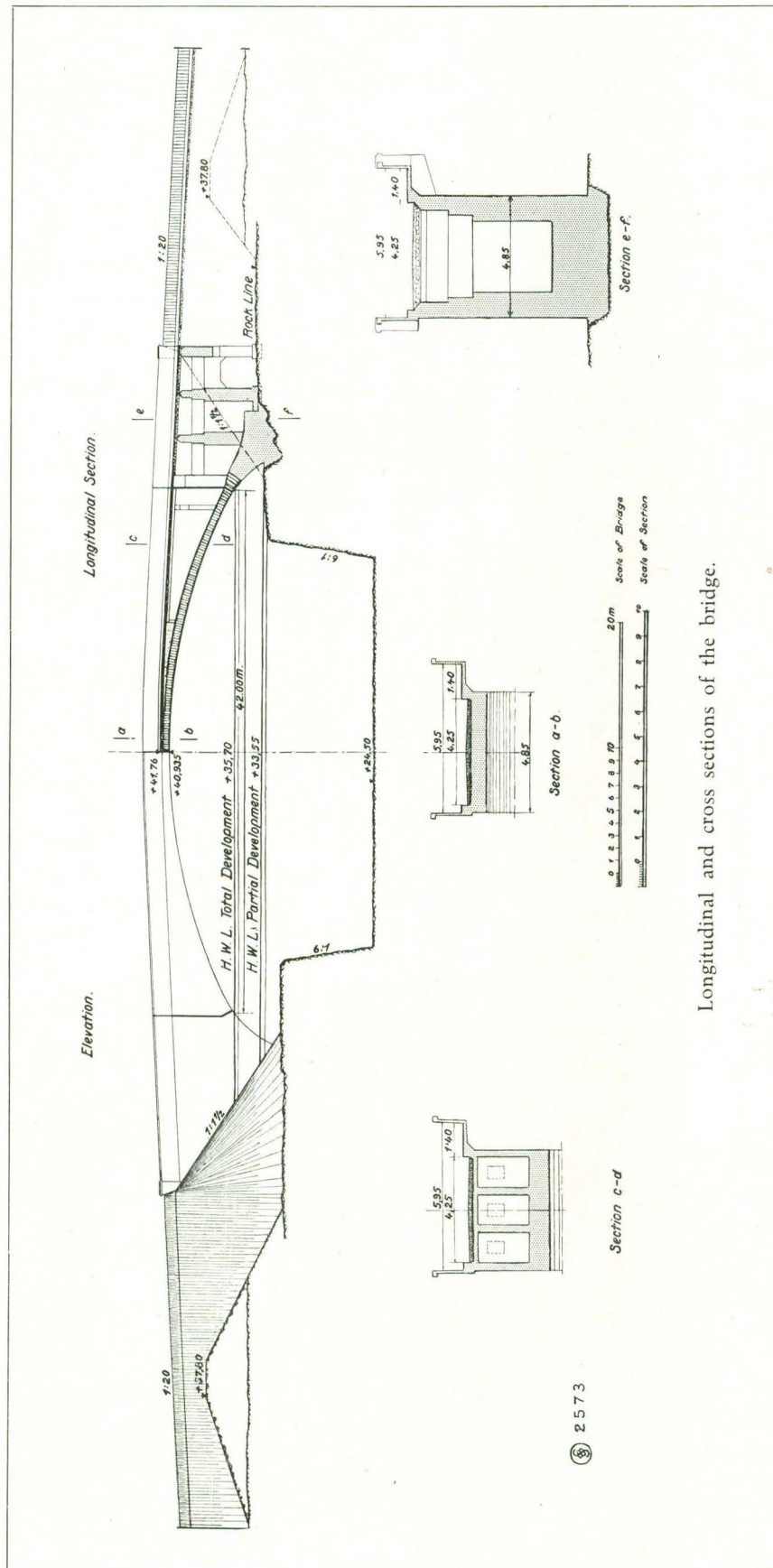
The excavation of the rock was carried on continuously day and night except for an interval every 6 hours for blasting. The rock drilling was done

with pneumatic hammers worked by means of 4 electrically driven compressors, each having an output of 6 cbm. per minute. These were placed close to the cutting. Later, however, electrically driven „Siemens“ percussion boring machines and 2 large drop hammer boring machines were erected, thus making it possible to loosen 1000 cbm. of rock at a time. The compressed air hammers were subsequently mainly used for levelling the bottom and trimming the slopes to the proper cross section.

The greater part of the rock was crushed by the large stone crusher at Clonlara into broken stone,



Finished roadway bridge with centering



Longitudinal and cross sections of the bridge.

chips and sand. These materials were used partly for concreting work and partly for stone pitching the Head Race. The surplus rock not put into the crusher was used for tipping the landside toe of the Head Race banks.

The rock section of the Head Race described above cuts off the village of Clonlara from the main roads to Limerick and Killaloe. This necessitated the erection of a bridge across the Head Race at Clonlara. This bridge is a 3-hinged arch bridge with a span of 42 m. between the bearings at the springings. The abutments are cantilevered, so that the arch of the bridge on both sides is about 5.0 m. longer, thus giving a total opening of about 52 m. for the whole of the bridge.

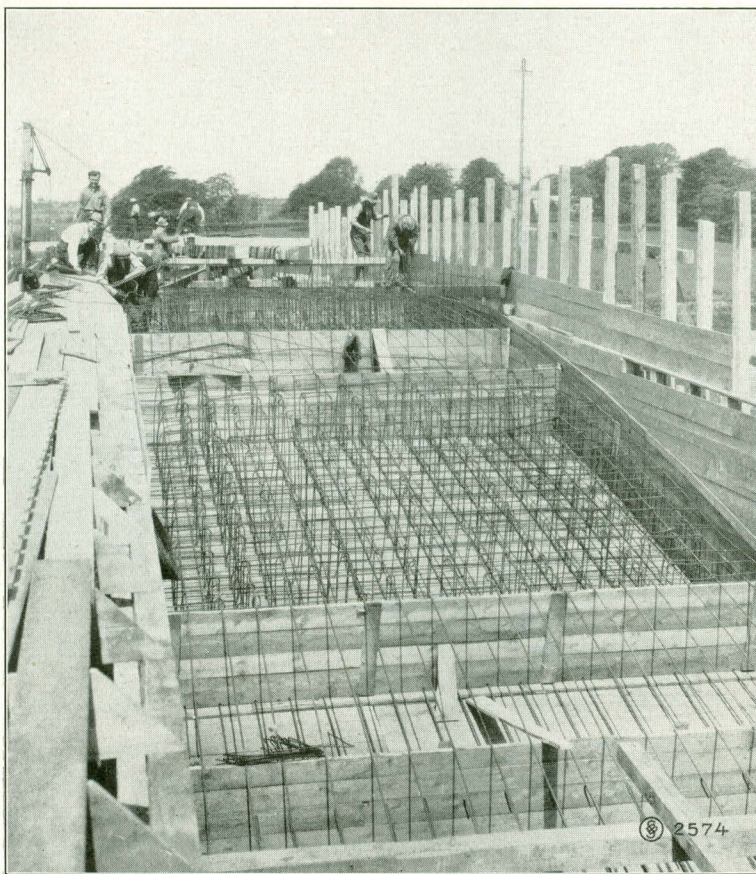
The bearings of the bridge at the crown and at the 2 abutments each consist of 5 separate cast steel pin bearings. The thickness of the reinforced concrete arch is 0.750 m. at the abutments, and 0.625 m. at the crown; the maximum thickness of 0.860 m. is reached between the crown and abutment bearings. The width of the arch is 4.85 m.; it has a light steel reinforcement, the concrete mixture being 1 : 5.

In order to support the carriage way on the arch, 4 longitudinal or spandril walls have been erected; these vary in thickness from 30—40 cm. The carriage way is a reinforced concrete slab 20 cm. thick; the footpath and parapets, which are also of reinforced concrete, are monolithic with it.

The width of the road over the bridge is 4.25 m.; there is a footpath 1.40 m. wide on one side and a 30 cm. curb on the other. The footpath is built as a cantilever off the roadway slab.

The crown of the bridge is about 17 m. above the level of the bottom of the canal. Approach ramps at a gradient of 1:20 were required on both sides of the bridge in order to join up with the levels of the existing roads. The abutments are of a box type with several cross walls bracing the side walls together.

The earth and rock work for the abutments was started in February 1928. The excavation was carried down to sound rock and even a little further in order to ensure a thorough connection between the rock foundation and the concrete of the abutments. In addition steps were made in the bottom of the foundation pit. The aggregate used for the concrete



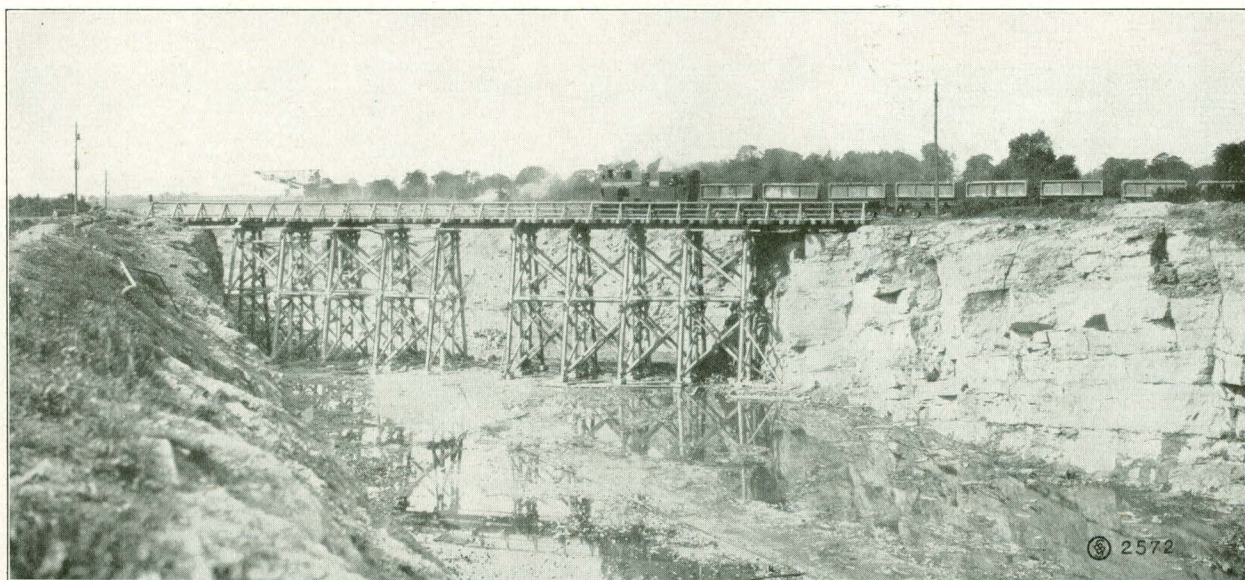
Placing of the reinforcement for the 3-hinged arch

was broken stone, chips and sand of good hard limestone as well as washed sand from the washing and sieving plant at the Weir. The concrete was mixed in concrete mixing machines of 1000 litre capacity each.

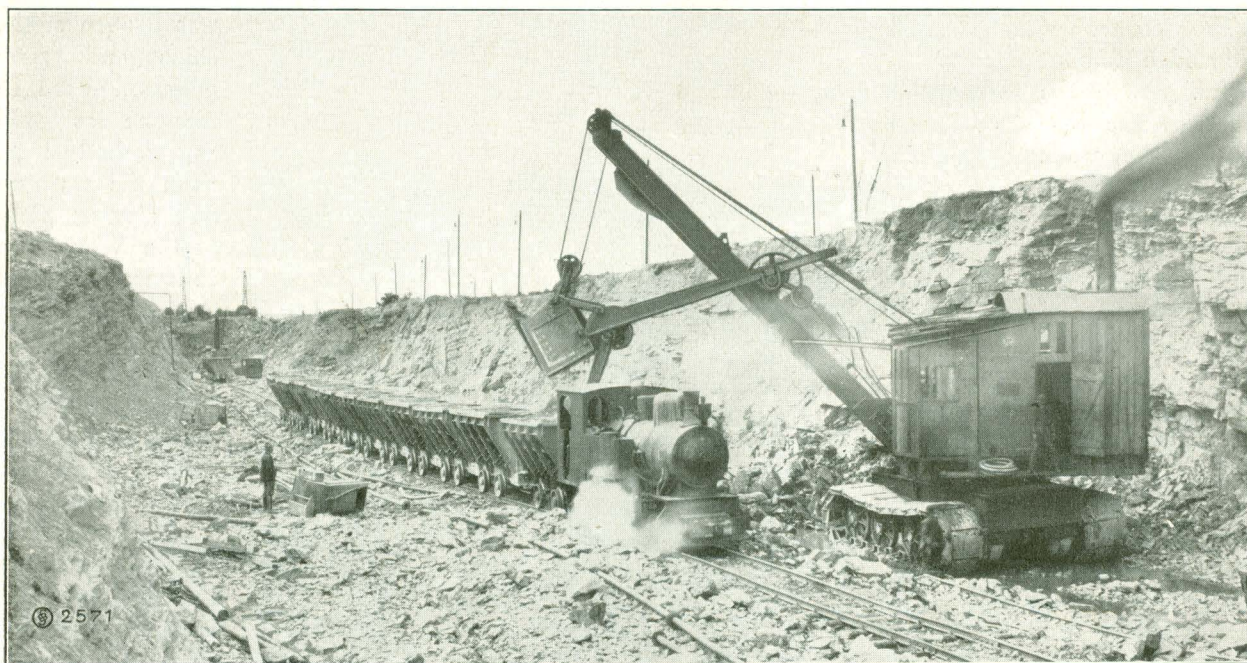
An elevator brought the concrete to the bridge from whence it was transported by hand waggons to any desirable point and then poured into the shutterings. In this way up to 75 cbm. of concrete were placed per shift.

The centering of the bridge was erected directly from the rock bed of the canal. The

upper part of the centering rested on 52 screw jacks with a carrying power of 20 tons each. These were provided in order to be able to carefully lower the



Timber railway bridge



Excavation of rock with steam shovel excavator on caterpillars

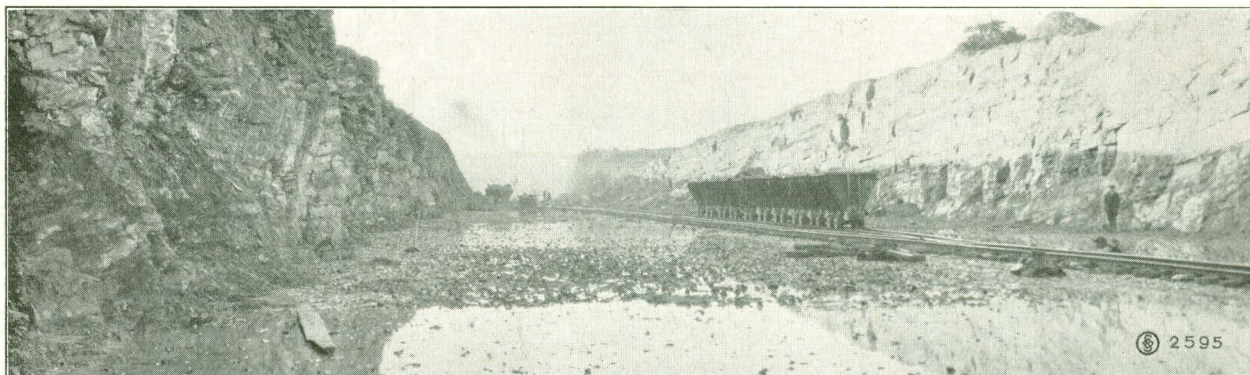
centering according to requirements on completion of the work. In order to obtain a uniform loading on the centering as well as an equal settlement of same, the arch was concreted in sections simultaneously on either side of the bridge.

Special attention was given to the placing of the bearings, which weighed more than a ton each; they were first placed in the recesses provided in the abutments and firmly secured on all sides by means of steel wedges; they were then encased and well propped up at the front. To

prevent the mortar they are embedded in getting into the inner surfaces of the bearings, the latter were surrounded with a steel sheeting, and the cement mortar then poured in through 2 openings at the top. The other half of the bearings, which were fixed in the concrete of the arch, were concreted in together with the latter.

The road bridge will be open to traffic in September.

A temporary timber bridge has been erected in order to bring the transport railway over the canal.



Finished part of the rockcut