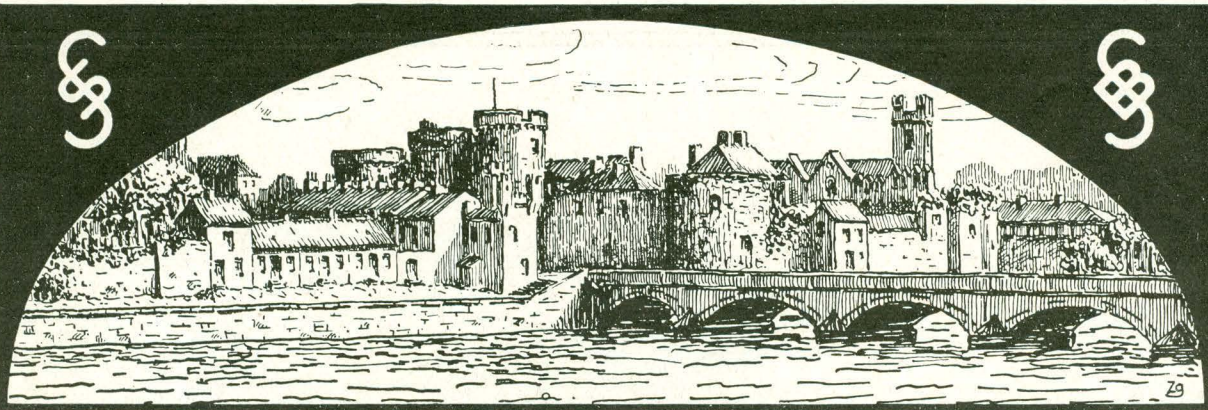




Siemens-Schuckertwerke
Aktien-Gesellschaft

SIEMENS

Siemens-Bauunion GmbH.
Kommandit-Gesellschaft

PROGRESS ON THE SHANNON

2nd YEAR

MAY 1928

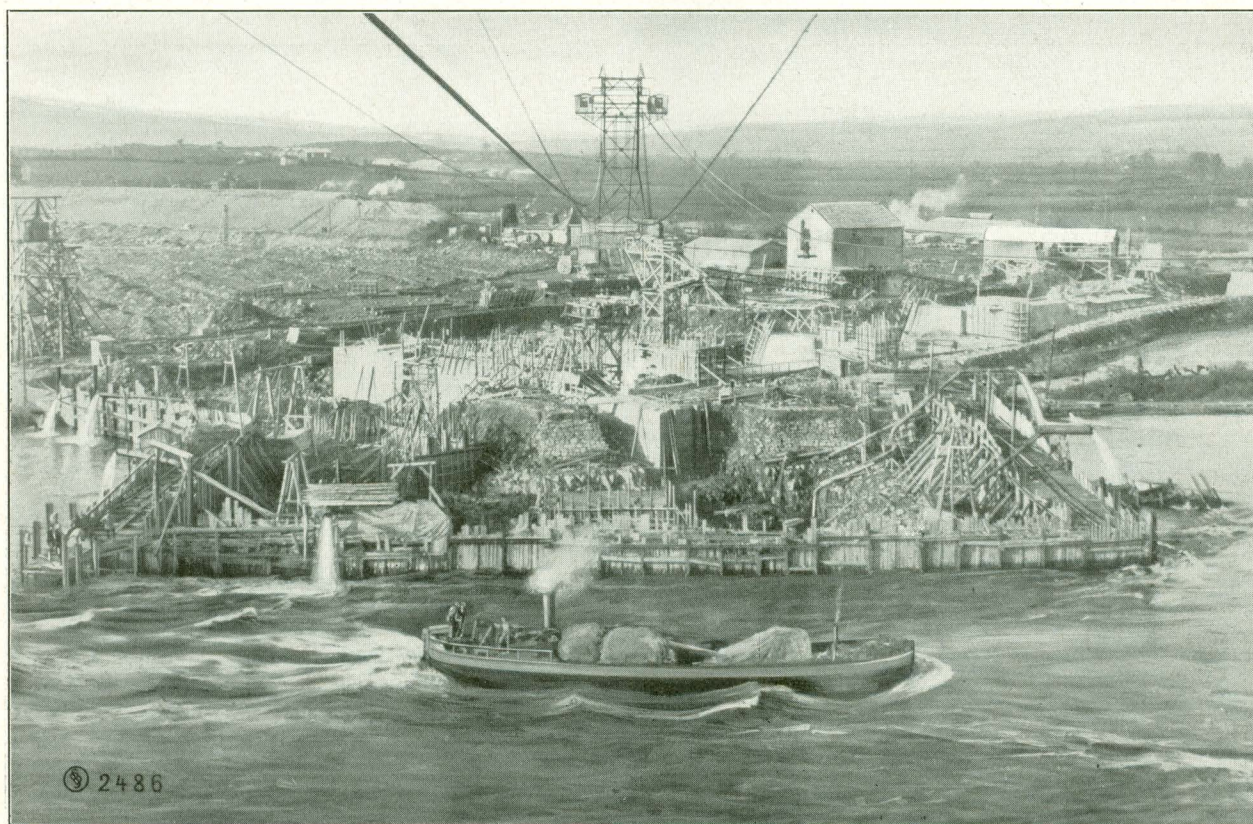
NUMBER 8

Construction of Weir Section I

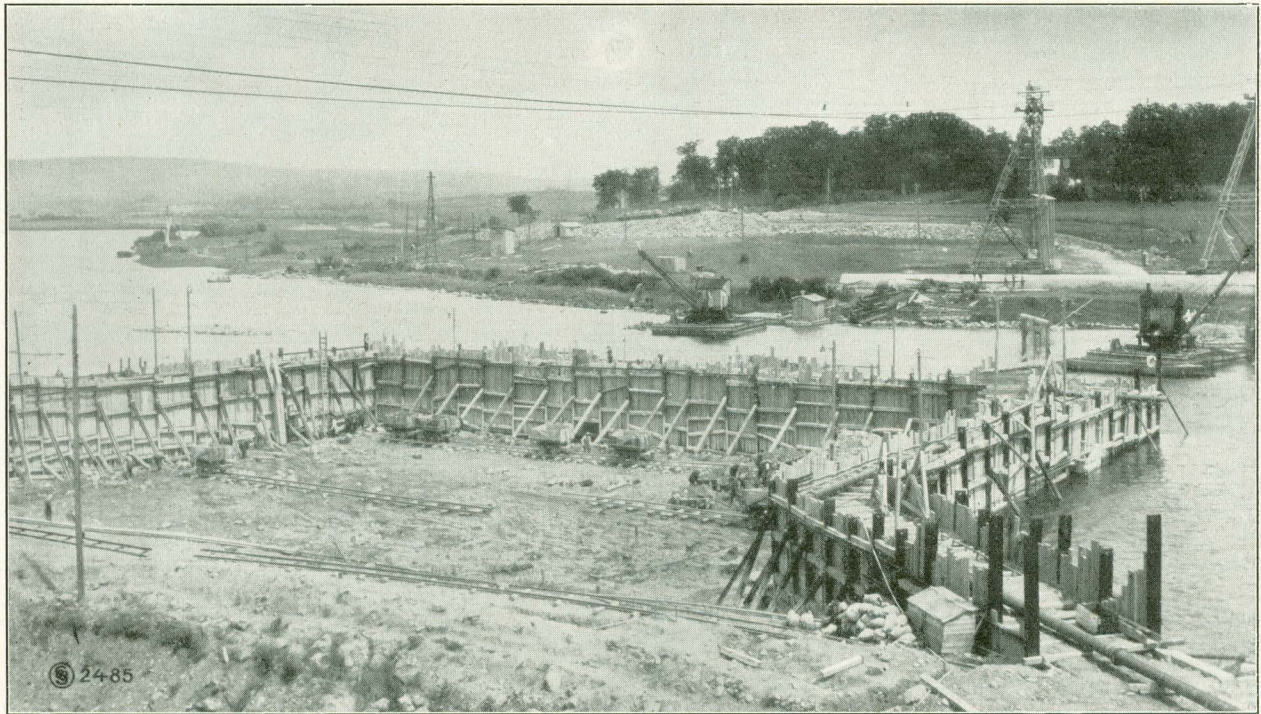
In the 1927 pamphlet No. 9 we gave an account of the arrangement of the Weir and Intake Building and in particular of the method adopted for the construction of the coffer dam for the Weir Section I.

In July 1927 the coffer dam was completed. When pumped out the walls of the dam proved to be very

watertight. Even during the long continued high water period in the winter of 27/28, which necessitated the raising of the level of the dam with sand-bags, the dam fulfilled its purpose. Only in very few places did water percolate through. The dam had the appearance of an island in the midst of extensively flooded country, and in its shelter men



Work in the Coffor dam during the Shannon high water period

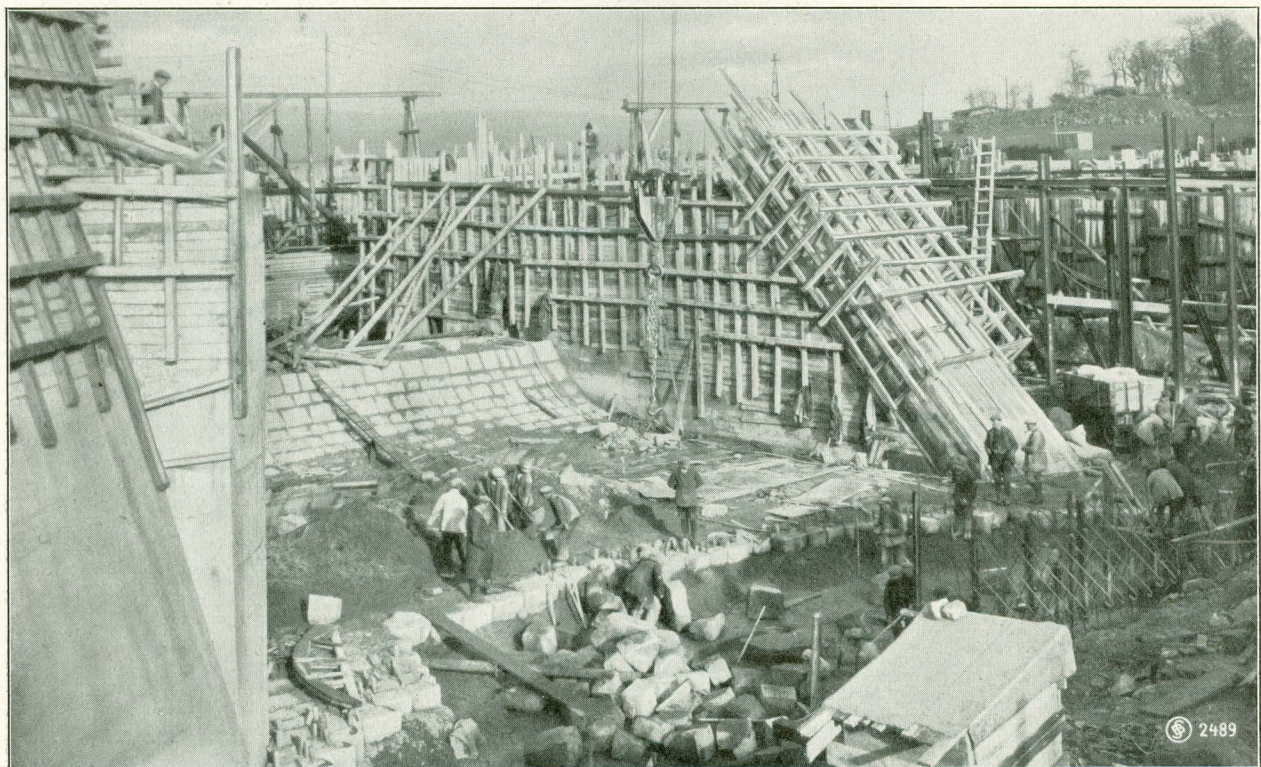


Coffer dam. I. Building Section after having been pumped dry

and machines worked in the dry to a depth of 11 m. (36 feet) below the level of the Shannon outside.

As soon as the river bed inside the coffer dam had been laid dry, excavation work for the first

2 Weir openings as well as for the middle piers between the Weir and Intake Building started immediately. The earth and rock material was partly loaded directly on to transport trains by means of

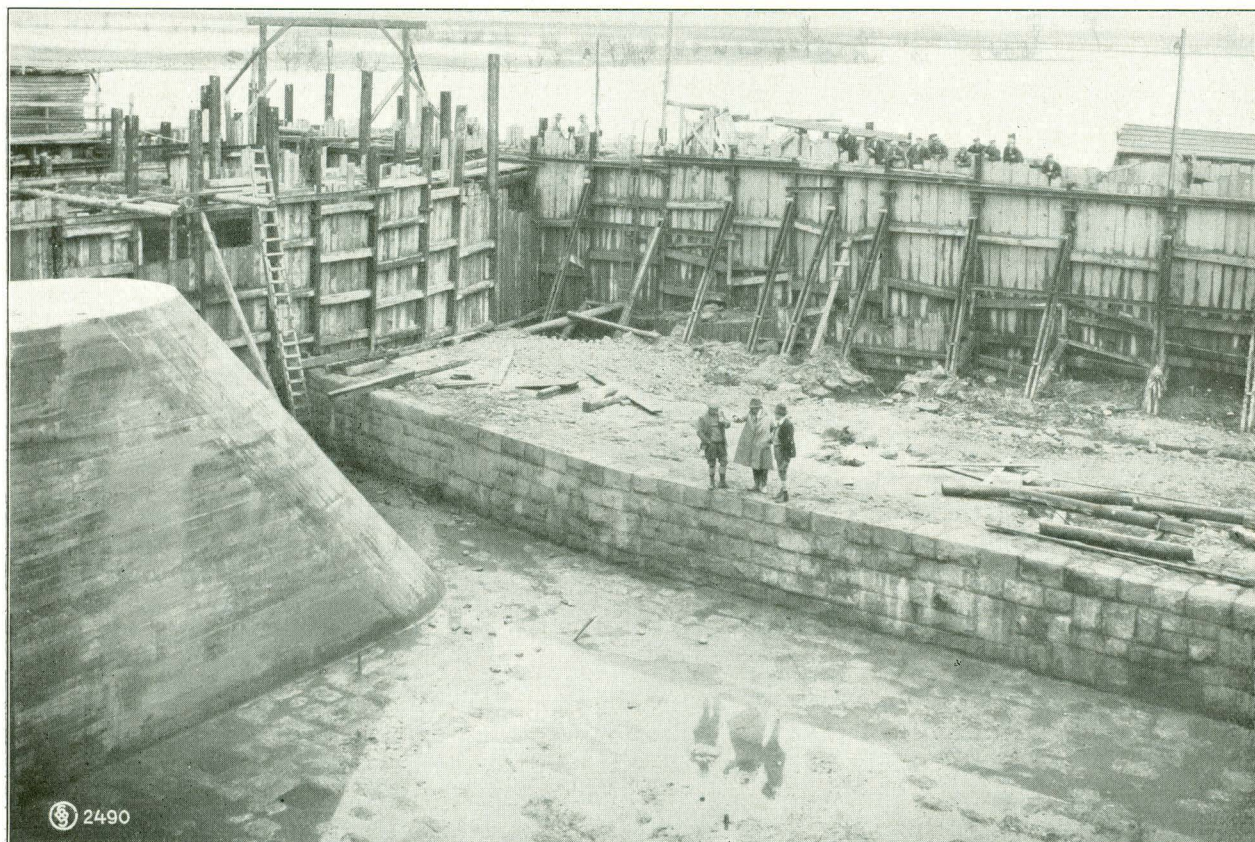


Granite facing of the spill basin

a shovel excavator, and a large portion had to be loaded by hand into trucks and large platforms which were then removed from the foundation pit by the cable crane. The platforms were emptied into railway trucks by means of a special plant. The Weir Building Site has 2 cable cranes with a radius of about 450 m. which extend over the Shannon and over the greater part of the Intake Building situated on the right bank. Each crane is built to carry 5 tons. On the right bank the cranes have a common fixed tower; the machinery

under the coffer dam through the upper fissured layers of rock. During periods of high water in the Shannon the percolation was such that it required 5 pumps, having a combined output of 2000 cbm. of water per hour, to keep the space within the coffer dam sufficiently dry to allow excavation to proceed. Excavation was carried on continuously during day and night except for a blasting interval every five hours.

Before concreting could be started, important work had to be carried out in connection with the water-



I. Weir Building Section completed

and the service hut are also here. On the left bank the towers are movable, so that the cranes can work over the whole area of the Weir Building Site.

The quality of the rock and the model tests (See No. 7. 1928) indicated that excavation would have to be carried down below the bed of the river to a depth of 3.5 m. This excavation was through a top layer of earth and boulders, then through fissured sandstone rock into sound hard red sandstone rock on which the superstructure was founded. The rock drilling was done with compressed air hammers worked by means of electrically driven Flottmann compressors having an output of 6 cbm. per minute. The excavation became more difficult as the depth increased owing to percolation

proofing of the rock foundation, a vital work for the stability of the structure. Under the spill basin on the tail water side of the Weir sill, earthenware pipes were laid along the natural rock fissures; these were cased in lean concrete and were provided here and there with vertical outlet pipes extending through the concrete to the surface of the spillway basin. In this way the stresses in the concrete of the spill basin caused by upward water pressure are avoided. To prevent the water percolating downstream through the fissures and cracks in the rock under the concrete Weir sills when the water level in the river is raised, the rock was made watertight by cement grouting; two rows of 5 m. deep holes were bored by means



Transport of the concrete by conveyor belt to the carrier of the cable crane

of boring machines under the Weir sill, thus cutting through the fissures in the rock. After the Weir sill had been concreted, the bore holes and consequently also the cracks and fissures were filled with cement grout under a pressure of 6 Atm. In this way along the upstream side of the Weir a watertight barrier was formed reaching down to 8.5 m. below the former rock surface. Only after this preparatory work had been carried out, which included the cleaning of the rock bed with steel brushes and with water under pressure, could the concrete work for the Weir be started. The abutments, spill basin and the first Weir pier then quickly made their appearance. The actual concreting itself at the Weir is done as follows.

The aggregates from the silos, namely sand, chips and broken stone, are dropped into tipping waggon in a tunnel under the silos. By means of an automatic weighing machine the waggon is provided with the necessary quantity of cement before being raised up a ramp to the concrete mixer. The concrete mixing plant for the Weir and Intake Building is in one building and consists of two 1000 litre mixing machines. The finished concrete is first put on a 20 m. long conveyor belt on an arm that can move round a semi-circle. By means of this belt part of the Intake Building can be concreted directly. For the concreting of the rest of the Intake Building and of the Weir, the belt

first conveys the concrete to the cable crane carriers of 2 cbm. capacity which in their turn bring it to the required place.

The bottom of the spill basin is provided with a 40–60 cm. thick granite facing or wearing surface to resist the great force of the water flowing over the Weir. As soon as a layer of the foundation concrete of the spill basin was ready, the placing of the granite blocks was begun. The granite from the Aughrim (Co. Wicklow) quarries was carefully dressed into suitable blocks; it was then loaded by Derricks and movable cranes on to flat trucks and transported to the cable crane whence it was brought to the required place. Special gangs were employed for the correct placing of the blocks. The joints between the separate blocks were completely filled in with cement mortar, and the stones in the lower sill or stop wall of the spill basin, which are especially subjected to water action, were anchored in the foundation concrete by means of round steel bars.

As a final work before the opening of the coffer dam, and also as preparatory work for the other buildings, a new coffer dam section for the coffer dam, system of the next Weir section was constructed on the already completed part of the Weir. The coffer dam could then be opened, and at present a few concrete blocks jutting out of the water are the only evidence of all the work that was done at this spot.